

THE TROOP CARRIERS AT NORMANDY AND CORREGIDOR: ENDURING LESSONS FOR TACTICAL AIRLIFT

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Art of War Scholars

by

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ABSTRACT

THE TROOP CARRIERS AT NORMANDY AND CORREGIDOR: ENDURING LESSONS FOR TACTICAL AIRLIFT, by Major Christopher R. Martinez, 117 pages.

During World War II, troop carrier aviation developed as a new form of combat flying in order to support emerging airborne tactics. Throughout the war, the troop carrier crews gained experience and developed methods of employment. The airdrop missions at Normandy and Corregidor were two key experiences in the development of airlift tactics. At Normandy, a substandard performance showed that lessons remained unlearned. Eight months later, the troop carriers flew a highly successful mission using a flexible and adaptive plan. As airlift has remained unchanged in many ways during its history, most lessons from the two drops apply today. Therefore, modern airlift doctrine can be analyzed by assessing whether or not it contains the lessons of the past. When examining modern airlift based on Normandy and Corregidor, two ideas stand out. The first is that modern tactics conform to the lessons of World War II. The second is that modern airlift doctrine and joint practices can improve in how they address air integration and cooperation between airlift and airborne forces, lessons learned at both Normandy and Corregidor.

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ACRONYMS

AFB	Air Force Base
AFI	Air Force Instruction
AFTTP	Air Force Tactics, Techniques, and Procedures
AGL	Above Ground Level
DZ	Drop Zone
ETO	European Theater of Operations
FM	Field Manual
IFF	Identification Friend or Foe
JFE	Joint Forcible Entry
JP	Joint Publication
MSL	Mean Sea Level
MTO	Mediterranean Theater of Operations
PIR	Parachute Infantry Regiment
USAF	United States Air Force

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CHAPTER 1

INTRODUCTION

Early on 16 February 1945, the roar of 51 C-47s' engines disturbed the morning stillness on Mindoro Island.¹ The aircraft were preparing to make the hour and a half flight to Corregidor Island loaded with airborne personnel and equipment from the 503rd Parachute Infantry Regiment (PIR). Due to the limited number of aircraft, the drops required multiple "lifts" or flights from each aircraft to drop everyone and everything needed for the operation. Because of the limited size of the Drop Zones (DZs) on Corregidor, each lift required multiple passes over the objective area. There would also need to be a third lift the next day. These limitations added complexity to the mission, driving the need for detailed planning and preparation by the aircrews performing the drops. However, the airborne planning was not initiated until 10 February 1945.²

The first aircraft began to roll down the runways at Elmore and Hill airfields at 0700 with a second flight following at 0730.³ Lieutenant Colonel (Lt Col) John Lackey, 317th Troop Carrier Group Commander, and his co-pilot Captain (Capt) Max W. Custer, 317th Operations Officer, flew the command plane with Colonel (Col) George M. Jones

¹ Carl A. Damberg, "Airborne Operation Corregidor," after action report, 1945, Headquarters 317th Troop Carrier Group, Combined Arms Research Library, Fort Leavenworth, KS, N-11138, 3.

² U.S. War Department, "Reduction in Time Factor in Launching an Airborne Operation," staff memorandum, General Staff G-3 (Washington, DC: War Department General Staff Training Division, 1946), 5.

³ Damberg, 3-4.

from the 503rd PIR and Lt Col John J. Tolson, Chief of Staff for the Sixth Army.⁴ The command plane's task was to relay information to the pilots of the C-47s to ensure the drops were going well. Jones and Tolson would jump after determining needed adjustments and passing them by radio to the aircrews.

Their navigator calculated a wind speed of 12 knots out of the northeast over the objective area.⁵ The wind continued to increase velocity, which caused the first jumpers to drift short of the DZs and land on the island's cliffs. To compensate, the leadership in the command plane directed the pilots to increase their count before giving the green light and lower the drop altitude from 650 feet above ground level (AGL) to 500 feet AGL.⁶ The lower drop altitude decreased time of fall under canopy, thereby decreasing wind drift effect.

The joint leadership team's changes went well. The 51 C-47s made 601 passes over the DZs dropping 2,019 paratroopers and 1,292 supply bundles. During the 189 sorties 26 C-47s received battle damage, but only one made an emergency landing and none were lost. Although the damage rate was high considering the total number of aircraft flown, only 13.7 percent of the sorties took damage and the rate further reduces to 4.3 percent damage when calculated against DZ passes.⁷ In the end, the drops enabled

⁴ Ibid., 3.

⁵ Ibid.

⁶ Ibid.

⁷ Ibid., 6.

Corregidor to be taken from the 5,643 enemy troops protecting the objective by two battalions of airborne personnel and one infantry battalion landing amphibiously.⁸

Less than one year earlier, on 5 and 6 June 1944, 1,143 C-47s and C-53s roared to life in the darkness across England.⁹ From fifteen locations, the aircraft began the invasion of Europe.¹⁰ Carrying 13,348 paratroopers and 1,641,448 pounds of equipment, they set out for six DZs that were enormous in comparison to the ones on Corregidor Island.¹¹ The threat was also vastly different as Normandy contained an integrated air defense with radar, flak, and fighter aircraft while Corregidor's defenders were largely isolated and had only small arms and anti-aircraft artillery. Just as the enemy was drastically different, so was the planning timeframe. For this mission, airborne planning started well in advance on 5 February 1944.¹² This was necessary to coordinate the efforts of 4,371 aircraft including bombers, fighters, gliders, and airlift.¹³

⁸ Ibid., 12.

⁹ Ninth Air Force, "Ninth Air Force Invasion Activities," after action report, 1944, Headquarters Ninth Air Force, Combined Arms Research Library, Fort Leavenworth, KS, N-9469, 44; Paul L. Williams, "IX Troop Carrier Command Report of Operation (Neptune)," 13 June 1944, after action report, Folder 546.452G 13 June 1944, Air Force Historical Research Agency, Maxwell Air Force Base, 6.

¹⁰ Ibid., 41.

¹¹ Ninth Air Force, 40-41, 44; USAF Historical Liaison Office, *USAF Airborne Operations: World War II and Korean War* (Maxwell AFB, AL: Air University Press, 1962), 45.

¹² U.S. War Department, "Reduction in Time Factor," 5.

¹³ Ninth Air Force, 54.

The C-47s and C-53s began their drops with twenty aircraft to insert Pathfinders.¹⁴ These men marked the DZs and set up navigational aids for the remaining aircraft. Those aircraft departed England in three phases made up of over thirty-five serials and employed in flights of nine aircraft each.¹⁵ Flying through the night, they relied upon the navigational equipment in the serial's lead aircraft and the Pathfinder's navigational aids for guidance.¹⁶ The plan worked well until the crews faced the enemy.

Once the German anti-aircraft artillery began firing, the plan to fly in line and not maneuver started to fall apart.¹⁷ Aircraft failed to maintain formation, losing track of the lead planes. Disagreements between jumpmasters and aircrews delay jumps. Unstable aircraft hampered the paratroopers' ability to exit properly.¹⁸ Paratroopers were spread all over France, some missing their intended DZ by miles.¹⁹

The D-Day drops did not go as planned. Approximately 1,500 airborne personnel were casualties upon landing, 41 Ninth Troop Carrier Command aircraft were destroyed, and 449 were damaged.²⁰ Eventually, the paratroopers rallied with their units and went

¹⁴ USAF Historical Liaison, 43.

¹⁵ Ninth Air Force, 42-44.

¹⁶ Daniel L. Haulman, "Before the D-Day Dawn: Reassessing the Troop Carriers at Normandy," *Air Power History* 51 (Summer 2004): 23.

¹⁷ John Weeks, *Assault from the Sky: A History of Airborne Warfare* (New York: Putnam's Sons, 1978), 90.

¹⁸ Ibid.

¹⁹ USAF Historical Liaison, 45.

²⁰ Ninth Air Force, 44; Weeks, 90.

forward to achieve their objectives. Still, the airlift efforts in Normandy were not to the standard anticipated and relied upon by paratroopers, leaving many lessons to be learned. These lessons and those from Corregidor influence airdrop operations today.

The question to be answered is: Does modern airlift doctrine capture all of the lessons from these two operations? This examination shows that while current American airlift doctrine contains many lessons learned related to airdrop tactics, it failed to absorb the results of wartime experiences in joint operations and integration of air assets, particularly in creating an effective team of airborne and airlift forces. Airlift aviation still uses many of the same tactics as executed at Normandy and Corregidor because airlift has not drastically changed in the past seven decades. The aircraft have gotten larger and more technologically advanced, but their speed and vulnerability have remained static as compared to other air assets. Therefore, almost all past experience is still applicable. Conducting case studies on the Normandy and Corregidor drops will glean valuable lessons to aid today's airdrop practitioners.

Analyzing how these operations relate to modern U.S. airlift relies on assessing whether or not today's doctrine captures the failures and successes experienced at Normandy and Corregidor. This requires also answering the question of what caused the outcomes of each operation. Other questions must also be answered: What tactics and theory did troop carrier planners use to plan the airdrops at Normandy and Corregidor, and upon what were they based? Does modern doctrine contain fixes for the failures and preserve the methods used in successes? Are there any lessons from Normandy or Corregidor that no longer apply? Using this approach, current airlift doctrine's merit can be examined based on actual combat operations.

Examining modern practices through this methodology is important as time moves further from the last war containing airdrops of multiple divisions, as seen at Normandy, and units making successive drops with the same airborne units, as happened at Corregidor. With that in mind, the airlift operations at Normandy and Corregidor offer two interesting cases of American application of air power, quite distinguishable from one another. They differ vastly in terms of size and environment. In Normandy massive amounts of aircraft were available for drops into large drop zones and movement of personnel and equipment. At Corregidor the aircraft numbers were so low multiple sorties were planned for each aircraft to drop on the island's extremely small drop zones. However, the aircraft used in each operation were the same, and the crews were products of the same training. In both events, the overall objectives of the airborne troops could not be met without the use of airlift. Therefore, aircrew performance was a major component of the operations. Their performance was based upon the training, tactics and theory of the era, and the experience of earlier airborne operations, making the study of these factors' impact on the two operations important. Understanding this will also promote a better understanding of airlift history and its influence on today's airlift doctrine and how crews are prepared for combat.

Previous researchers have analyzed the two airborne operations, but the events' differences in size lead to a corresponding difference in amount of research performed. Many scholars explore the airborne aspect of the Normandy invasion. The Battle of Corregidor has also been studied but to a much lesser degree. In both cases, researchers pay little attention to the aircrews performing the airlift mission. While it is easy to find historical studies of air power application during these operations and World War II as a

whole, the literature tends to focus on the actions of bomber and pursuit aircraft. With airlift being overshadowed by other forms of air power and the personnel carried and supplied, little is written about the critical role it played.

To find detailed information regarding airlift at Normandy and Corregidor, researchers must rely upon period documents and studies performed during and after the war. Field Manuals from the timeframe help explain the employment of airlift aircraft during World War II. They contain planning factors and limitations of air movement of ground forces to consider when choosing a transportation option.

Studies performed by the U.S. government are useful as well as are the after action reports and studies written during World War II. Luckily, many documents are available to include after action reports from two massive airborne training events at Camp Mackall, NC. The after action reports written after the operations at Normandy and Corregidor also exist and give detailed information regarding troop carrier participation in the operations.

The amount of information available does not equate to a corresponding amount of study of airlift operations. This leaves unexplored aspects of Operation Overlord and the Battle of Corregidor. The lacking analysis of the operations' airlift component is not unique. Finding substantial study and research regarding airlift is rare, a surprising fact considering the common use of airlift during American combat operations.

Knowledge of airlift history is important not only for gaining a better understanding of modern airlift practices; it is also informative as to the possible use of airborne personnel against modern threats. Currently, Russia and China both present themselves as enemies to American interests. Normandy offers an example of a large-

scale airborne insertion in Europe, a possible tool for use against Russian aggression. Corregidor is a historical example of an island assault in the Pacific offering lessons for planners looking to secure an airhead in the South China Sea. These comparisons are not made to imply that these operations will be necessary; rather they are to show the relevance of studying two diverse operations utilizing airborne forces in order to influence modern practices.

With these options for modern use in mind, it is necessary to analyze current thought on actually using airborne insertion. One telling source is the U.S. Army Warfighting Challenges. The twelfth challenge, “Conduct Joint Expeditionary Maneuver and Entry Operations,” and its learning demands show the Army’s rightful focus on what happens after landing. How to train for, command, and equip these operations are apparent concerns for the Army. One learning demand even addresses using sea maneuver as a possible entry option to overcome enemy anti-access/area-denial capabilities.²¹ This leaves the questions regarding how to overcome the same threats from the air to Air Force personnel. Normandy and Corregidor offer two plans to begin addressing this challenge as both involved penetration into airspace defended by enemy anti-aircraft assets.

Another telling development in airborne thought is the reduction of forces trained as jump qualified in the American Army. In recent years the Army chose to remove the jump status of twenty-four units in response to budgetary concerns while some promote

²¹ Army Capabilities Integration Center, “Army Warfighting Challenges,” 2 December 2016, accessed 27 December 2016, <http://www.arcic.army.mil/Initiatives/ArmyWarfightingChallenges>.

the idea that paratroops are unnecessary.²² Reducing the number of jump-capable forces shows that the capability is not a priority. However, by not completely removing parachute insertion forces, the Army shows that it is not willing to completely divest itself from the capability.

The Army's preservation of airborne forces should force the Air Force to assess its capability to provide sufficient air capabilities to enable such an operation while also continually modifying and improving airlift theory and doctrine. In order to do so, air planners must understand the history of paratrooper transport while admitting that combat paratroop drop experience is at a minimum in the current force. Therefore, it is imperative to study and learn from the past.

Past lessons began in 1930 when the Russian military became the first to incorporate airborne tactics in a major exercise.²³ They continued when Germany became the first nation to use paratroopers in combat during their 1940 invasions of Norway, Holland, and Belgium.²⁴ As World War II progressed, American forces learned from their own experiences beginning on 8 November 1942 in North Africa during Operation

²² Brett Barrouquere, "Army Dropping Number of Paratrooper Units," *Associated Press*, 1 December 2013, accessed 27 December 2016, <http://www.military.com/daily-news/2013/12/01/army-dropping-number-of-paratrooper-units.html>.

²³ James A. Huston, *Out of the Blue: U.S. Army Airborne Operations in World War II* (West Lafayette, IN: Purdue University Studies, 1972), 47-48.

²⁴ *Ibid.*, 47.

Torch and continued through drops into Sicily and Salerno.²⁵ The painful lessons from these operations laid the foundation for troop carrier aviation during the war.

Using the lessons from previous drops, the troop carriers continued to develop their practices leading up to the drops at Normandy and Corregidor. During both missions the troop carriers improved upon past performances in certain aspects, but they also faced new challenges not previously seen in troop carrier aviation. By developing methods to overcome those challenges, or failing to do so, they added to the doctrinal knowledge for future airlift operations. Furthermore, their contributions to the development of this new form of aviation were only based on their training and experience since troop carrier doctrine was not published until after the drop at Corregidor.²⁶ However, airborne doctrine did exist and offered limited planning and operating guidance to troop carriers personnel.²⁷

In Normandy the troop carriers dropped with poor accuracy due to difficulties overcoming the challenges of flying in formation at night and in clouds while under fire. However, their plan created sound practices for overcoming navigational issues experienced in previous drops. Operation Neptune also showed the importance of shared understanding between airlift and airborne forces and integration with other air assets.

²⁵ USAF Historical Liaison, 1, 9; John C. Warren, *USAF Historical Studies No. 74: Airborne Missions in the Mediterranean 1942-1945* (Maxwell AFB, AL: Air University Press, September 1955), 41, 65-69.

²⁶ U.S. War Department, Army Air Forces Field Manual, *Tactical Doctrine of Troop Carrier Aviation* (Washington, DC: Government Printing Office, 4 September 1945), 13.

²⁷ U.S. War Department, Field Manual, (FM) 31-30, *Tactics and Technique of Air-Borne Troops* (Washington, DC: Government Printing Office, May 1942), 1.

Corregidor taught similar lessons about the need for integrated support and the benefits of unity between airlift and airborne personnel. However, the troop carriers at Corregidor faced other challenges associated with drops to small DZs in an island environment. They also developed methods for overcoming resource issues in terms of available aircraft, and their performance serves as an example for balancing risk and operational need. Furthermore, the Corregidor mission teaches the importance of flexibility in airlift operations.

Modern doctrine does a good job accounting for the tactical lessons of each operation, but it does not fully address the shared lessons from Normandy and Corregidor. Joint Publication (JP) 3-17, *Air Mobility Operations*, mentions the need for air superiority but does not address how to integrate air mobility platforms with other aircraft. Furthermore, it gives no mention to communication between airlift and airborne planners beyond the airborne force commander and airlift mission commander coordinating tactical considerations such as routing and DZ location.²⁸ JP 3-18, *Joint Forcible Entry Operations*, does a better job discussing coordination between commanders and command relationships, but it does not address building a shared understanding of operational needs and objectives.

Besides the JPs mentioned above, doctrine for airborne operations exists only in Air Force Tactics, Techniques, and Procedures (AFTTP) publications for C-130J, C-130H, and C-17 fundamentals and in the Field Manual (FM) for airborne operations. The three AFTTPs do not address integrated planning with paratroopers, nor do they address

²⁸ Joint Chiefs of Staff, Joint Publication (JP) 3-17, *Air Mobility Operations* (Washington, DC: Government Printing Office, 2013), IV-17–IV-18.

integrating with other air assets. FM 3-99, *Airborne and Air Assault Operations*, does a better job discussing a coordinated planning effort between airborne and airlift forces, but it does not offer guidance concerning the broader concept of creating a shared understanding of purpose.

The scope of existing doctrine should be expected. The JPs maintain their proper role in addressing command relationships. The AFTTPs and FM also stay within their proper scope by addressing tactical planning and procedures focused on the concerns of their intended audience. Although beyond the scope of this paper, the answer to addressing these shortcomings may lie in the creation of a new joint manual for airborne and forcible entry operations targeting Company and Field Grade Officers that addresses the two communities as one team and contains standard planning and operating procedures. This would ease planning, hasten preparation, and serve as a foundation for creating a shared understanding.

Addressing the relationship between airlift and airborne units is important because organizational factors now exist that differ from World War II. During World War II, Troop Carrier Command aircraft and crews were dedicated to tactical airlift, and they focused on their specialized tasks. Troop carriers in World War II flew at altitudes as low as 300 feet above the ground at speeds as slow as 95 knots over enemy territory with no ability to return fire on threats or bail out of their aircraft when hit. They developed a culture that focused on mission accomplishment in the face of danger. This type of flying and mission-oriented culture separated them from Ferrying Command and Air Transport Command crews. Troop carriers, therefore, developed “a sense of identity that would characterize their attitude and relationship to the world of airlift and the Air Force for

decades to come.”²⁹ Their specialization also created a unique relationship with the soldiers they carried. This proved valuable during the Corregidor operation.

Today’s airlifters do not have the ability to specialize in one aspect of mobility aviation. Due to resource scarcity and continuous worldwide operations, C-130s and C-17s perform a wide array of missions. Furthermore, the C-17 community only qualifies some of its crews to perform airdrops. This leads to airdrop competing for training time and focus with other tasks, many of them more commonly performed in recent combat experience. Therefore, doctrine should be used to preserve as many lessons from past personnel airdrops as possible. It should also aid in creating understanding between airlift and airborne personnel by including planning factors and force characteristics not readily apparent those not trained in each capability.

Preserving lessons learned in combat and promoting a better joint culture between airborne and airlift forces is important to strengthening a combat capability that has been used during every conflict in which the United States has been involved since the creation of paratroop tactics. Although parachute assaults have taken place during every major American operation starting with World War II, there has been little study of the practice from the air perspective. The U.S. Army recognizes in its Warfighting Challenges that issues exist regarding Joint Forcible Entry (JFE) operations including aurally inserted JFE forces. However, the majority of Air Force study of the practice exists only in the C-130 and C-17 communities. Similarly, studies of past airborne operations usually focus on the paratroopers and their actions after landing. These studies give little information

²⁹ Robert C. Owen, *Air Mobility: A Brief History of the American Experience* (Washington, DC: Potomac Books, 2013), 57.

concerning how the ground personnel arrived at the battlefield and the successes and failures involved in the air operations. With many historical examples from which to extract lessons learned, a disservice is being done to the airlift community. By examining past use of parachute insertion from the air perspective, improvements can be made to airlift theory.

Operation Overlord and the Battle of Corregidor are excellent choices for thorough examinations. In both cases airlift played a vital role in the success of the operations. However, the lack of focus on airlift, and airdrop in particular, by higher leadership left capability and tactical imperfections. The contributions of airlift offer lessons at all levels of war from the tactics employed to the strategic impact of airlift's use. Furthermore, airlift deficiencies at Normandy and Corregidor display the importance of proper training, precise planning, and tailored use of the capability. Understanding the influence of airlift training, tactics, and theory on the overall outcomes of the two operations enables a more thorough comprehension of enduring airlift concepts.

The enduring concepts retained in doctrine say little about personnel airdrop operations. Modern airlift doctrine should exist that addresses how to plan and conduct personnel airdrop and Joint Forcible Entry operations. Furthermore, its role should be to bridge the gaps between joint partners' understanding of how these operations occur. This will reduce planning time, create more effective training, and promote a team mindset between participants. The goal of the new doctrine should be to increase coordination and unify the efforts of airborne and airlift components. The operations at Normandy and Corregidor serve as good case studies from which to extract the lessons to begin strengthening this area of modern American airlift doctrine.

CHAPTER 2

TACTICAL AIRLIFT DOCTRINE

Airlift Theory Development through World War II

Theory regarding the use of airlift to insert ground forces began in October 1918, during World War I, when Brigadier General William “Billy” Mitchell proposed a plan to capture Metz using parachutes to land infantry personnel behind German defenses. The plan was approved, but it was not put into practice before the war’s end.³⁰ Following the war, air power theorists such as General Henry H. “Hap” Arnold continued to explore air transport tactics and capabilities. Concepts for airlift’s use discussed in 1921 included using paratroopers to land behind enemy lines, and parachute insertion was proposed as one method to attempt to capture the Mexican bandit Pancho Villa.³¹ By 1930 the U.S. Army had already purchased or tested eighty-eight types of transportation aircraft.³² By the end of the 1930s an unpublished doctrine existed regarding air transportation. This doctrine viewed air transport as of lesser importance than combat aviation, comparing combat aviation’s place in the Air Force as equivalent to infantry’s place of prominence

³⁰ James A. Huston, *Out of the Blue: U.S. Army Airborne Operations in World War II* (West Lafayette, IN: Purdue University Studies, 1972), 47.

³¹ Charles E. Miller, *Airlift Doctrine* (Maxwell AFB, AL: Air University Press, 1988), 9.

³² *Ibid.*, 1.

in the ground forces.³³ Furthermore, this doctrine made no mention of airdrop of personnel or equipment.³⁴

Although the United States had approved a plan to use paratroopers during World War I and experimented with their use in 1928, the Russian military was the first to incorporate the tactic in a major exercise, doing so in 1930.³⁵ The Russians continued to spearhead development of parachute infantry and in 1935 created the “Airlanding Corps.”³⁶ In 1936, the Russians dropped two battalions during an exercise near Kiev with foreign observers present, sparking interest in paratroop tactics in many other nations. Of these nations, Italy and Germany showed the most eager response.³⁷

American interest in paratroopers did not subside. The Command and General Staff School at Fort Leavenworth began studying airborne theory in 1938 by including it in the school’s curriculum and using exercises to develop doctrine concerning organization of an airborne operation.³⁸ However, American airborne development continued to be outpaced by other nations. The Germans first used parachute insertion in 1940 in Norway, Holland, and Belgium.³⁹ They also started using glider insertion during

³³ Ibid., 19.

³⁴ Ibid.

³⁵ Huston, 47-48.

³⁶ Ibid., 47.

³⁷ Ibid.

³⁸ Ibid., 48.

³⁹ Ibid.

this time period. The German use of paratroopers culminated with their assault on Crete on 20 May 1941.⁴⁰ This attack used a combination of parachute, glider, and airland insertion to deliver 25,000 troops, 13,000 of which arrived via parachute.⁴¹ Their success in holding Crete sparked new determination in the Allies to develop parachute forces; however, the Germans endured casualties at a rate high enough to end further large-scale airborne operations for the duration of the war.⁴² After Crete the Germans only attempted two more parachute assaults, both battalion sized, one in fall 1943 and one in December 1944.⁴³

German lack of confidence in paratroopers did not slow American efforts to build its own airborne and airlift forces. The German success at Crete and Russian exercises convinced the United States that airborne tactics had merit, and America continued to build its airborne and troop carrier forces while exploring airborne concepts. The troop carriers also worked to develop combat tactics, but went to war with no doctrine of their own. Rather, they pieced together guidance from other publications.

Before its first use in combat, troop carrier aviation had guidance from Field Manual (FM) 100-5, *Operations*, which contains an eight-page chapter concerning troops transported by air. This manual says little about troop carrier tactics, but it does

⁴⁰ Ibid.

⁴¹ Gerard M. Devlin, *Paratrooper! The Saga of U.S. Army and Marine Parachute and Glider Combat Troops during World War II* (New York: St. Martin's Press, 1979), 102-103.

⁴² Huston, 48.

⁴³ Ibid.

acknowledge the need for surprise and air superiority.⁴⁴ Furthermore, it shows an understanding of the need to integrate with other forms of combat aviation to succeed in troop carrier operations.⁴⁵ These same characteristics are reinforced in FM 31-30, *Tactics and Technique of Air-Borne Troops*, but the manual says little else about troop carrier aviation as it is focused on paratrooper tactics and training.⁴⁶ The publication with the most troop carrier information existing before the first combat paratrooper drop was FM 31-35, *Aviation in Support of Ground Forces*. This manual addressed the same considerations as FM 100-5 and FM 31-30 while also including considerations focused on coordinating airborne and troop carrier planning efforts.⁴⁷ Furthermore, FM 31-35 discusses tactics and capabilities of troop carriers including formation flying and precision landings although there is no mention of exact methods, formation geometries, or numerical tolerances.⁴⁸

Although it is unknown if FM 31-35 and FM 31-30 were distributed early enough to be widely studied before the first combat airborne operation, they did exist when the U.S. Army first used paratroopers in combat in North Africa as a component of Operation

⁴⁴ U.S. War Department, Field Manual, (FM) 100-5, *Field Service Regulation: Operations* (Washington, DC: Government Printing Office, 22 May 1941), 241-248.

⁴⁵ *Ibid.*, 244.

⁴⁶ U.S. War Department, Field Manual, (FM) 31-30, *Tactics and Technique of Air-Borne Troops* (Washington, DC: Government Printing Office, May 1942), 33-34.

⁴⁷ U.S. War Department, Field Manual, (FM) 31-35, *Aviation in Support of Ground Forces* (Washington, DC: Government Printing Office, April 1942), 37-39.

⁴⁸ *Ibid.*, 36.

Torch on 8 November 1942.⁴⁹ The airborne participation in Torch proved that many lessons about troop carrier aviation were still unknown. The troop carriers' mission was by no means an easy one. The plan made them fly at night and in bad weather with only dimmed formation lights to keep track of other aircraft during the 1,100-mile flight.⁵⁰ Due to the long flight, the aircrews each had five members: pilot, copilot, navigator, radioman, and engineer.⁵¹ The navigators' mission was especially difficult. Only eleven of the thirty-nine C-47s had the America-built instruments familiar to the navigators.⁵² The others received British versions the night before the mission.⁵³ Furthermore, only the navigators in the four flight lead aircraft had acceptable charts, although these were of only limited use due to the clouds obstructing landmarks with which to find the planned course.⁵⁴ After overcoming these self-imposed obstacles, they then faced enemy antiaircraft artillery and fighter aircraft.⁵⁵

⁴⁹ USAF Historical Liaison Office, *USAF Airborne Operations: World War II and Korean War* (Maxwell AFB, AL: Air University Press, 1962), 1.

⁵⁰ John C. Warren, *USAF Historical Studies No. 74: Airborne Missions in the Mediterranean 1942-1945*, (Maxwell AFB, AL: Air University Press, September 1955), 10-13.

⁵¹ *Ibid.*, 9.

⁵² *Ibid.*, 10.

⁵³ *Ibid.*

⁵⁴ *Ibid.*

⁵⁵ *Ibid.*, 11.

The mission did not go well. Many navigators failed to perform successfully as they had to rely on celestial navigation techniques.⁵⁶ The pilots were not much better as many lost contact with their formation leads due to the poor visibility experienced on the cloudy night.⁵⁷ Still, thirty-three of the aircraft did make it to the objective area near Oran, but drops only occurred once they regrouped after some had circled waiting to find the formation and others landed on dry lakebeds to wait for other aircraft.⁵⁸ After the drop, an enemy fighter downed one C-47, others were forced to land after running out of fuel, and some troop carrier personnel and aircraft were captured.⁵⁹ In the chaos of the mission, only ten aircraft dropped their airborne troops while approximately 250 paratroopers joined the fight after their planes landed.⁶⁰ Operation Torch was a success overall, but the airborne made little contribution to the effort, and leadership considered their mission a misappropriation of airborne forces.⁶¹ This mission also proved troop carriers were too busy with cargo and logistics missions to train for their primary mission of dropping paratroopers.⁶²

⁵⁶ Ibid., 10.

⁵⁷ Ibid.

⁵⁸ USAF Historical Liaison, 3.

⁵⁹ Warren, *Study No. 74*, 12.

⁶⁰ Ibid.

⁶¹ Ibid., 13-14.

⁶² Warren, Warren, *Study No. 74*, 18-19; Weapons Systems Evaluation Group, "WSEG Staff Study No. 3: A Historical Study of Some World War II Airborne Operations," Combined Arms Research Library, Fort Leavenworth, KS, N-17309.1, 141.

After Torch, paratroopers made four more jumps in North Africa. These missions showed the benefits of daylight operation for troop carriers and provided confidence in airborne tactics.⁶³ The lessons learned in North Africa began the first-hand education of American troop carrier forces and advanced the unwritten doctrine for personnel airdrop.

After North Africa and before the next American attempt to use parachute insertion, one other document was published that had some bearing on troop carrier aviation. FM 1-5, *Employment of Aviation of the Army*, repeated the doctrine contained in previous FMs. It also addressed the logistical challenges of coordinating a large movement of troops by air, especially before takeoff.⁶⁴ Furthermore, it used stronger language in assessing the vulnerability of troop carriers and called for not just air support but also secrecy for protecting an airlift operation.⁶⁵ Still, the written doctrine did not address specific tactics for employing tactical airlift.

The piecemeal troop carrier doctrine's next test occurred when Allied leadership called for airborne participation during the Sicilian Campaign. The first drop was Operation Husky I on 9-10 July 1943 with Husky II following on 11-12 July.⁶⁶ A glider operation called Ladbroke also took place on 9-10 July, and Operation Fustian on 13-14 July completed the airborne insertions in Sicily.⁶⁷

⁶³Warren, *Study No. 74*, 19.

⁶⁴ U.S. War Department, Field Manual, (FM) 1-5, *Employment of Aviation of the Army* (Washington, DC: Government Printing Office, January 1943), 51-52.

⁶⁵ *Ibid.*, 52.

⁶⁶ USAF Historical Liaison, 9.

⁶⁷ *Ibid.*

The Sicilian drops were much larger than those in North Africa. Husky I involved 3,405 paratroopers transported by 227 C-47s, Husky II had 1,900 men and 144 planes, and Fustian required 135 aircraft to drop 1,856 British paratroopers.⁶⁸ These missions, like Operation Torch, showed that troop carriers and paratrooper missions were imperfect events. During the night Husky I took place aircrews became lost and fell out of formation.⁶⁹ This resulted in less than 17 percent of the troops landing on or near their intended DZ with some as far as sixty-five miles from their objective.⁷⁰ Trouble then continued after the drop for the troop carriers too with eight being shot down and ten damaged.⁷¹

The number of planes taking battle damage only got worse during Husky II. This mission was going well compared to past troop carrier efforts. The C-47s maintained good formations and navigated well.⁷² The plan for airborne movement after the first day of the invasion called for a corridor over naval assets in which aircraft would not be fired upon.⁷³ Unfortunately, someone opened fire on the troop carriers causing the remaining antiaircraft personnel to begin firing.⁷⁴ When the mission concluded twenty-three C-47s

⁶⁸ USAF Historical Liaison, 12, 16; James M. Gavin, *Airborne Warfare* (Washington, DC: Infantry Journal Press, 1947), 2.

⁶⁹ USAF Historical Liaison, 11.

⁷⁰ Ibid.

⁷¹ Ibid.

⁷² Warren, *Study No. 74*, 39.

⁷³ Ibid., 37.

⁷⁴ Ibid., 39.

did not return and thirty-seven were severely damaged.⁷⁵ Six of the aircraft were downed before dropping their paratroopers.⁷⁶ After the mission it was determined that the majority of troop carriers downed during the mission were destroyed by friendly naval fire.⁷⁷

The trend in friendly fire continued during Operation Fustian. Again, naval gunners opened fire on the troop carrier formation downing two planes and forcing nine to return to base due to aircraft damage or injured pilots.⁷⁸ In all forty-four C-47s were fired upon by friendly forces during the mission.⁷⁹ This completed a frustrating chapter in troop carrier history. However, Sicily taught many lessons that shaped future airborne operations.

In Sicily, troop carriers learned that navigation was not yet good enough, and they needed aids such as beacons and ground signals.⁸⁰ This provided the impetus to create pathfinders for troop carrier operations similar to the ones already in use for bomber missions.⁸¹ The troop carriers also learned to avoid friendly antiaircraft guns unless proper coordination was completed to ensure that no aircraft will be fired upon.⁸² Finally,

⁷⁵ Ibid., 40.

⁷⁶ Ibid., 41.

⁷⁷ Ibid., 40.

⁷⁸ Ibid., 51.

⁷⁹ Ibid., 48.

⁸⁰ USAF Historical Liaison, 18; Warren, *Study No. 74*, 54.

⁸¹ Huston, 113.

⁸² Warren, *Study No. 74*, 54.

the need for better training was established, especially in the areas of navigation, night flying, and formation flight.⁸³ However, Sicily taught a large portion of America's military leadership, including Secretary of War Henry L. Stimson and the Commanding General of Army Ground Forces, Lt. Gen. Lesley J. McNair, that airborne operations were ineffective, expensive, and futile.⁸⁴

The poor performance in Sicily may have led to the handling of troop carrier aviation in FM 100-20, *Command and Employment of Air Power*, which superseded the previously discussed version of FM 1-5.⁸⁵ This document removes all discussion of troop carrier operations. Instead, troop carrier aviation is defined and placed under tactical aviation.⁸⁶ Troop carrier aviation is also mentioned as a possible component of an air force.⁸⁷ It is also possible, however, that the sparse discussion of troop carriers may have been in an effort to reduce redundancy in publications as the document does refer the reader to FM 31-35, which contained more information on the aviation genre.⁸⁸

The naysayers' belief that airborne actions were too dangerous to be valuable was quelled when a mission successfully reinforced Americans fighting at Salerno and proved

⁸³ Ibid.

⁸⁴ Ibid.

⁸⁵ U.S. War Department, Field Manual, (FM) 100-20, *Command and Employment of Air Power* (Washington, DC: Government Printing Office, July 1943), 1.

⁸⁶ Ibid., 3.

⁸⁷ Ibid., 4.

⁸⁸ Ibid., 3.

the merits of parachute insertion.⁸⁹ The three drops at Salerno used the past lessons learned to execute with no aircraft losses and improved drop accuracy on two of the three missions.⁹⁰ The third scattered paratroopers throughout a mountainous region, but the successes of the first two missions and their importance to the overall operations laid the foundation for America's continued use of airborne envelopment tactics and development of troop carrier doctrine.

Eight days before the Salerno airdrops began, troop carriers in the Pacific Theater of Operations flew their first drop into Nadzab on 5 September 1943.⁹¹ Using 84 C-47s to drop 1,700 paratroopers, the Pacific-based troop carriers performed a highly successful mission and began adjusting doctrine based on their experiences flying in an island environment.⁹² One of the key lessons learned during this mission was the importance of integrated air support when flying a mission during the day and offering little terrain behind which to mask the approach to the objective area.

One month later, a document that was almost troop carrier-specific doctrine was published. Entitled "Training Circular No. 113," the document's expressed purpose was distributing "information based upon experience gained in recent combat operations concerning the employment of airborne and troop carrier forces."⁹³ While still giving

⁸⁹ Warren, *Study No. 74*, 41.

⁹⁰ *Ibid.*, 65-69.

⁹¹ USAF Historical Liaison, 23.

⁹² *Ibid.*, 24.

⁹³ U.S. War Department, "Training Circular No. 113" (Washington, DC, Government Printing Office, October 1943), 1.

very broad guidance, it was the first instance of some specifics being contained in a published document and it also contains some tactical considerations for troop carrier aviation. It delineated principles of employment, advantages and disadvantages, and planning considerations for troop carrier operations.⁹⁴ It also described command relationships between airborne and troop carrier leadership and assigns responsibilities to each commander.⁹⁵ Furthermore, it outlined tactical considerations such as route and altitude selection and suggests techniques for conducting night operations.⁹⁶

Throughout “Training Circular No. 113” the influence of the experience gained in North Africa, Sicily, and Salerno is apparent. The timing of the publication is also interesting as October 1943 is also when the men of the IX Troop Carrier Command began to arrive in England. Once in England they began planning, preparing, and training for Operation Neptune.⁹⁷ This makes the training circular a rather important document, as it was the last troop carrier guidance published before planning began for the invasion of Normandy.

After Operation Neptune’s completion, an update FM 100-5 was released. This publication updates the previous version with a chapter concerning airborne troops

⁹⁴ Ibid., 2-7.

⁹⁵ Ibid., 8.

⁹⁶ Ibid., 3 and 6.

⁹⁷ John C. Warren, *USAF Historical Studies: No. 97, Airborne Operations in World War II, European Theater* (Maxwell AFB, AL: Air University Press, September 1956), 17-18.

instead of grouping them into troops transported by air.⁹⁸ It focuses on parachute troops instead of troop carriers in its discussion of tactics, but does repeat the previous version's calls for air superiority and joint planning.⁹⁹ It also goes further in its discussion of integrated air operations, addressing the differences between night and day missions with regard to preliminary air attacks.¹⁰⁰ The most important aspects of this document exist in its handling of troop carriers' role and interaction with airborne forces. First, the manual specifies troop carriers' primary mission as supporting airborne forces, as opposed to ferrying missions and routine transport.¹⁰¹ In essence, the 1944 version of FM 100-5 solidifies the troop carriers as a dedicated tactical airlift force. Second, it insists on realistic joint training and exercises.¹⁰² This guidance is vital for creating a strong joint force with a positive working relationship as familiarity is built in training as one team.

The need for proper training was reinforced by the experience of troop carriers dropping at Noemfoor. On 3 and 4 July 1944, 1,418 paratroopers jumped from 73 C-47s onto the Kamiri airstrip.¹⁰³ Drop accuracy was poor, 65 to 70 percent on the zone, and

⁹⁸ U.S. War Department, Field Manual, (FM) 100-5, *Field Service Regulation: Operations* (Washington, DC: Government Printing Office, 15 June 1944), 290.

⁹⁹ *Ibid.*, 291-292.

¹⁰⁰ *Ibid.*, 295.

¹⁰¹ *Ibid.*, 292.

¹⁰² *Ibid.*, 294.

¹⁰³ Samuel T. Moore, "Tactical Employment in the U.S. Army of Transport Aircraft and Gliders in World War II: A Study Based on the Histories of Troop Carrier Command and Other Pertinent Data," Folder 546.04, Air Force Historical Research Agency, Maxwell Air Force Base, 310.

one out of every eight paratroopers was injured during the jump.¹⁰⁴ Due to the preceding months of flying other types of missions, the troop carriers' airdrop and formation flying skills had deteriorated.¹⁰⁵ The mission proved that "satisfactory paratroop delivery requires continuous training and rehearsal."¹⁰⁶ Therefore, a new training system was put into place in order to refocus the troop carriers on their primary mission.¹⁰⁷ The experience at Noemfoor proved valuable at Corregidor in another way as the same airborne and troop carrier units worked together in both operations.

World War II troop carrier experience continued in Europe with Operation Market Garden in September 1944 where many of the lessons of Normandy were validated.¹⁰⁸ The drop on Corregidor took place in February 1945. Finally, on 24 March 1945, troop carriers in Operation Varsity used the lessons of drops to conduct what some considered the most successful airborne mission to date.¹⁰⁹ Corregidor and Varsity were last major American airborne operations of the war in their respective theaters.

The lessons troop carriers learned during World War II were captured in doctrine completed in September 1945 and approved for release on 13 January 1946. Many of the previously recorded principles and considerations for troop carriers remain in this

¹⁰⁴ Ibid., 310-311.

¹⁰⁵ Ibid., 310.

¹⁰⁶ Ibid.

¹⁰⁷ Ibid., 311-312.

¹⁰⁸ Warren, *Study No. 97*, 154-155.

¹⁰⁹ Ibid., 192.

document such as the necessity of air superiority and split responsibilities for the troop carrier and airborne commanders.¹¹⁰ The manual also provides more details than previous publications in regard to some aspects of troop carrier aviation. For example, it gives more planning considerations and offers more about integrated planning with other air components.¹¹¹ Furthermore, it gives factors to aid planners in route, altitude, and drop zone selection.¹¹² This manual also dictates that standard operating procedures must be established by troop carriers and makes a strong case for building teamwork through training.¹¹³ The first troop carrier doctrine did a superb job capturing the lessons of World War II, a fact made apparent by the similarities it shared with today's airlift doctrine.

Modern Airlift Doctrine

Two organizational changes occurred after World War II that greatly influence tactical airlift practice. The first was the creation of an independent air force in 1947. The second occurred in 1996 when all C-130s were placed under the control of Air Mobility Command, thus removing them from the more tactically focused Air Force commands.¹¹⁴

¹¹⁰ U.S. War Department, Army Air Forces Field Manual, *Tactical Doctrine of Troop Carrier Aviation* (Washington, DC: Government Printing Office, 4 September 1945), 22, 34-36.

¹¹¹ *Ibid.*, 29-30.

¹¹² *Ibid.*, 34.

¹¹³ *Ibid.*, 28, 47.

¹¹⁴ Robert C. Owen, *Air Mobility: A Brief History of the American Experience* (Washington, DC: Potomac Books, 2013), 260.

The first change removed the troop carriers from the service of the airborne personnel they carried. The second change meant that there was no longer a segment of airlift aviators focused exclusively on tactical missions, although the ability to focus solely on paratrooper drops had been lost long before. Based on these changes, the necessity of retaining best practices in doctrine becomes more imperative.

Modern airlift doctrine exists in two main areas: joint publications and tactical manuals. Joint Publication (JP) 3-17, *Air Mobility Operations*, shows how lasting lessons from World War II are. Its list of coordination items for airborne and airlift commanders is obviously founded on the similar list found in the 1945 *Tactical Doctrine of Troop Carrier Aviation*. For example, both address the shared responsibility in selecting flight routes and drops zones even offering the same considerations for the selection of each.¹¹⁵ Unfortunately, JP 3-17 offers little else about airdrop operations. It lists advantages and disadvantages, discusses methods of airdrops and types of drop zones, but does not offer suggestions for employment of airdropping aircraft.¹¹⁶ Instead, the publication gives planning considerations focused on pre-flight logistics and movements similar to those found in the 1942 version of FM 31-35.¹¹⁷

JP 3-18, *Joint Forcible Entry Operations*, also reflects World War II lessons learned and even specifically refers to that conflict as the roots of many capabilities used

¹¹⁵ Joint Chiefs of Staff, Joint Publication (JP) 3-17, *Air Mobility Operations* (Washington, DC: Government Printing Office, 2013), IV-18; U.S. War Department, *Tactical Doctrine of Troop Carrier Aviation*, 34.

¹¹⁶ Ibid., IV-17-IV-25.

¹¹⁷ Joint Chiefs of Staff, JP 3-17, IV-25–IV-26; U.S. War Department, FM 31-35 and 38-39.

in forcible entry operations.¹¹⁸ Like World War II-era guidance, JP 3-18 addresses the need for control of the air and advises using rehearsals to increase integration and synchronization.¹¹⁹ The publication differs from World War II guidance in that it is addressing any forcible entry force, not merely airborne and airlift throughout the majority of the document. Those forces are mentioned, but they only become the focus in Appendix B, “Airborne and Air Assault Operations.” This section addresses airborne and air assault simultaneously and does not offer any doctrinal direction for airlift forces.¹²⁰

The general nature of JP 3-17 and JP 3-18 and their lack of little specific guidance for airlift are expected. As joint level guidance they correctly focus on command relationships and other big picture concerns. Tactical manuals such as Field Manual (FM) 3-99, *Airborne and Air Assault Operations*, have more information on personnel airdrop. FM 3-99 is rightfully focused on the Army’s role in airborne operations. It says little about airlift besides calling for airborne planners to work closely with airlift planners.¹²¹ It does, however, give descriptions of different air missions that may be needed for an airborne operation and includes a discussion of airlift’s missions in that section.¹²²

¹¹⁸ Joint Chiefs of Staff, Joint Publication (JP) 3-18, *Joint Forcible Entry Operations* (Washington, DC: Government Printing Office, 2012), I-2.

¹¹⁹ *Ibid.*, I-3 and IV-1.

¹²⁰ *Ibid.*, B-1-B-6.

¹²¹ Department of the Army, Field Manual (FM) 3-99, *Airborne and Air Assault Operations* (Washington, DC: Government Printing Office, March 2015), 3-7.

¹²² *Ibid.*, 5-14–5-16.

Airlift tactics concerning paratroop missions are contained in Air Force Tactics, Techniques, and Procedures (AFTTP) publications. The three applicable to tactical airlift are AFTTP 3-3.C-130J, *Combat Aircraft Fundamentals C-130J*, AFTTP 3-3.C-130H, *Combat Aircraft Fundamentals C-130H*, and AFTTP 3-3.C17, *Combat Aircraft Fundamentals C-17*. Although contained in three separate documents, the tactical principles for the three airframes are nearly identical. They use formation flight, threat avoidance, and low altitudes to prevent enemy engagement and ingress to an objective area where they slow to drop speed and climb or descent to drop altitude. Following drop they use the same low-level, threat avoidance tactics to egress. This is identical to the tactics used in World War II troop carrier aviation. The AFTTPs offer many techniques and tactics to use in paratrooper operations that are adaptable to various situations, promoting a flexible plan. As the manuals are specific to an aircraft and its crews, they say little about the airborne personnel carried or capabilities of supporting aircraft.

With current doctrine existing at the joint command level, for airborne units, and for specific aircraft, there is no doctrine addressing lower-level aspects of these operations such as how to form a joint team at the lower level in order to work towards mission accomplishment. Furthermore, there is little guidance for airlift planners for integrating with other air assets. Doctrine needs to address planning and conducting personnel airdrop at the small unit leader level in order to create joint understanding.

The need for joint teamwork was learned in World War II including during the airdrops at Normandy and Corregidor, but it is not adequately addressed in doctrine. Tactical lessons from these operations are included in doctrine or addressed with equipment. One example is the use of night vision goggles to overcome some of the

obstacles faced in Normandy. Another is the use of aircraft systems to maintain positional awareness of other aircraft in weather, another item that would have helped in Normandy. Other tactical ideas have lasted from these operations and exist in present day doctrine, such as the use of altitude for threat avoidance and formation for mass during airdrops. Lessons omitted exist in conceptual areas like creating shared understanding and in more complex aspects of airborne insertion missions like how to integrate the airlift force into a larger air package. Ideas for building this doctrine exist in an analysis of the missions to Normandy and Corregidor.

CHAPTER 3

NORMANDY

Planning and Preparation

By the summer of 1943 Allied leadership envisioned an invasion of France in order to push through Europe and into Germany, but a lack of resources threatened the operation. Accordingly, the date was set for May 1944 to allow equipment and personnel to arrive.¹²³ This delay also allowed ample time to plan and then re-plan the coming mission.

Starting in February 1944, airborne and airlift planners began to create their vision for Operation Neptune, the ground invasion portion of Operation Overlord.¹²⁴ In the full invasion plan, the airborne portion was one small piece, despite being one of the largest airborne missions ever attempted. The 82nd and 101st Airborne (ABN) Divisions were tasked in the operation, requiring a vast number of troop carrier aircraft. When the plan was finalized, this number came to 1,022 aircraft and crews, the entirety of the IX

¹²³ James M. Gavin, *Airborne Warfare* (Washington, DC: Infantry Journal Press, 1947), 38-39; James A. Huston, *Out of the Blue: U.S. Army Airborne Operations in World War II* (West Lafayette, IN: Purdue University Studies, 1972), 171-173; USAF Historical Liaison Office, *USAF Airborne Operations: World War II and Korean War* (Maxwell AFB, AL: Air University Press, 1962), 41; John C. Warren, *USAF Historical Studies: No. 97, Airborne Operations in World War II, European Theater* (Maxwell AFB, AL: Air University Press, September 1956), 1-2.

¹²⁴ U.S. War Department, "Reduction in Time Factor in Launching an Airborne Operation," staff memorandum, General Staff G-3 (Washington, DC: War Department General Staff Training Division, 1946), 5.

Troop Carrier Command's fifty-six squadrons.¹²⁵ Their task was to deliver the 82nd ABN to the north of Carentan near Ste. Mere-Eglise on Drop Zones (DZs) A, C, and D and the 101st ABN west of St. Sauver le Vicomte on Drop Zones N, T, and O.¹²⁶ This would allow the airborne forces to block German reserves and secure key bridges and causeways to allow the invasion forces to move inland.¹²⁷

The IX Troop Carrier Command tasked its A-5 section with planning the airlift. This hastily created organization consisted of three officers moved from A-3 and one representative from each of the three troop carrier wings in the command.¹²⁸ One month after the unit began planning, a Naval Liaison Officer from the Royal Navy was added to the section, bringing the total to seven people to plan the airlift of two American ABN divisions.¹²⁹ The planning cell was not completely on their own, however, as planning conferences were used to coordinate their efforts with 82nd and 101st ABN division planners.¹³⁰

¹²⁵ Ninth Air Force, "Ninth Air Force Invasion Activities," after action report, 1944, Headquarters Ninth Air Force, Combined Arms Research Library, Fort Leavenworth, KS, N-9469, 32.

¹²⁶ Gerard M. Devlin, *Paratrooper! The Saga of U.S. Army and Marine Parachute and Glider Combat Troops during World War II* (New York: St. Martin's Press, 1979), 358; Gavin, 43; Huston, 181.

¹²⁷ Gavin, 43-44.

¹²⁸ R. P. Carr, "Troop Carrier Planning for Operation Neptune, England Feb-Jun 1944 (Cross Channel Invasion of Europe), (Personal Experience of a Troop Carrier Wing Representative on the Planning Staff)" (Monograph, School of Combined Arms Regular Course, Fort Leavenworth, KS, 1947), 5.

¹²⁹ *Ibid.*, 6.

¹³⁰ *Ibid.*

Before the planners at the IX Troop Carrier Command received their guidance, key leaders of the Allied forces had to finalize the concept. In January 1944, then-Lt Gen Dwight D. Eisenhower, chosen as Supreme Commander of the Allied Expeditionary Force on 5 December 1943, worked with Gen Bernard L. Montgomery, Lt Gen Omar N. Bradley, and Lt Gen Miles C. Dempsey to plan a five-division amphibious assault on the French coastline with two additional divisions dropped behind Utah Beach.¹³¹ The generals issued the plan on 1 February as Neptune Initial Joint Plan while the generals tried to secure enough landing craft and troop carrier aircraft to make the operation possible.¹³² To this end, Eisenhower had to request from Washington a force of 1,040 planes and crews to man them for the IX Troop Carrier Command to allow one division to be lifted at a time.¹³³ A third airborne division was desired, but securing the aircraft and crews needed to drop even two divisions was doubtful. Eventually, on 2 March, leadership issued an amended Initial Joint Plan to add the third airborne operation with the shortfall in aircraft overcome by use of multiple lifts performed by American and British troop carriers.¹³⁴

On 23 February the IX Troop Carrier Command and airborne planners began their operational planning.¹³⁵ The first conference between the two branches was sufficient to

¹³¹ Warren, *Study No. 97*, 6-7.

¹³² *Ibid.*, 7-8.

¹³³ *Ibid.*

¹³⁴ *Ibid.*, 9.

¹³⁵ *Ibid.*

select and approve DZs and formulate tentative lift schedules for airborne and glider-borne units.¹³⁶ Taking into account flak and anti-aircraft artillery (AAA) positions provided by intelligence from the Eighth and Ninth Air Forces, this allowed the troop carrier planners to select routes to the objective areas.¹³⁷ The routes were kept simple. The troop carriers would fly from their fifteen fields to three wing assembly points then to a command assembly point named “ELKO.” From there the plan took the IX Troop Carrier Command southwest over the English Channel before turning southeast toward the Initial Point in order to split the Alderney and Guernsey and thereby avoiding AAA located on the Channel Islands.¹³⁸ If planning the mission today, based on modern airlift practices the route chosen and use of this type of airborne assembly would be very similar.

Having the routes chosen early is a key factor in large-scale, integrated air planning because it allows supporting assets to accomplish detailed planning with less chance of major adjustments due to airlift planning, another planning method carried into modern airlift. Route selection was further complicated by the massive number of aircraft flying into the objective area at night while blacked out. Collision avoidance was a major concern for planners and influenced route and altitude selection.¹³⁹

¹³⁶ Carr, 6.

¹³⁷ Ibid., 7.

¹³⁸ Warren, *Study No. 97*, 11-13.

¹³⁹ Carr, 8.

The hazard of air-to-air collision was not the only driving factor for the altitudes flown. There was also German radar, flak, and small arms to consider. Due to German radar, Allied troop carriers had to fly an altitude of 1,500 feet over England with a descent to 500 feet over the English Channel to preserve surprise. Although lower altitudes help to mitigate detection, a climb back to 1,500 feet was planned over Normandy in order to reduce the effects of small arms fire.¹⁴⁰ This choice balanced risk between the most lethal and most likely threats faced. Furthermore, the more deadly threats should have been avoided based on the planned route. Approaching the DZ, another altitude change was planned to level at 700 feet and slow from the en route speed of 140 miles per hour (mph) to 110 mph.¹⁴¹ A climbing left turn back to the approach routing was then accomplished fly back to base at 150 mph.¹⁴² This meant that the aircraft would be flying head on into approaching aircraft with only altitude separating them at night, blacked out, and with radio silence.¹⁴³ However, this risk simplified de-confliction with other aircraft performing tactical strikes and eased integrated planning.

The IX Troop Carrier Command aircraft planned to employ in nine-ship flights, flying in their standard “V” of “Vs” formation with each “V” consisting of an aircraft left

¹⁴⁰ Warren, *Study No. 97*, 12.

¹⁴¹ John A. Kindig, “The Operations of the 101st Airborne Division East of Ste. Mere Eglise, 5-6 June 1944 (Normandy Campaign), (Personal Experience of an Assistant G-3)” (Monograph, Advanced Officers Course, Fort Benning, GA, 1947), 14; USAF Historical Liaison Office, 44.

¹⁴² Carr, 8; Kindig, 14.

¹⁴³ Paul L. Williams, IX Troop Carrier Command Field Order No. 1: Neptune-Bigot, 31 May 1944, Folder 533.451-12 Part 1, Air Force Historical Research Agency, Maxwell Air Force Base, 5.

and aft of lead and another right and aft. Two “Vs” then flew in positions left and right aft of the lead “V.” These flights were combined into serials composed mainly of thirty-six or forty-five aircraft but with some containing as many as fifty-four.¹⁴⁴ Each wing’s serials formed at their assembly point after departing from three fields for the 50th Troop Carrier Wing, seven fields for the 52nd, and five fields for the 53rd.¹⁴⁵ These serials were preceded by the Pathfinders in six serials of three planes (eventually increased to twenty total aircraft) tasked with setting up navigational beacons on the DZs.¹⁴⁶

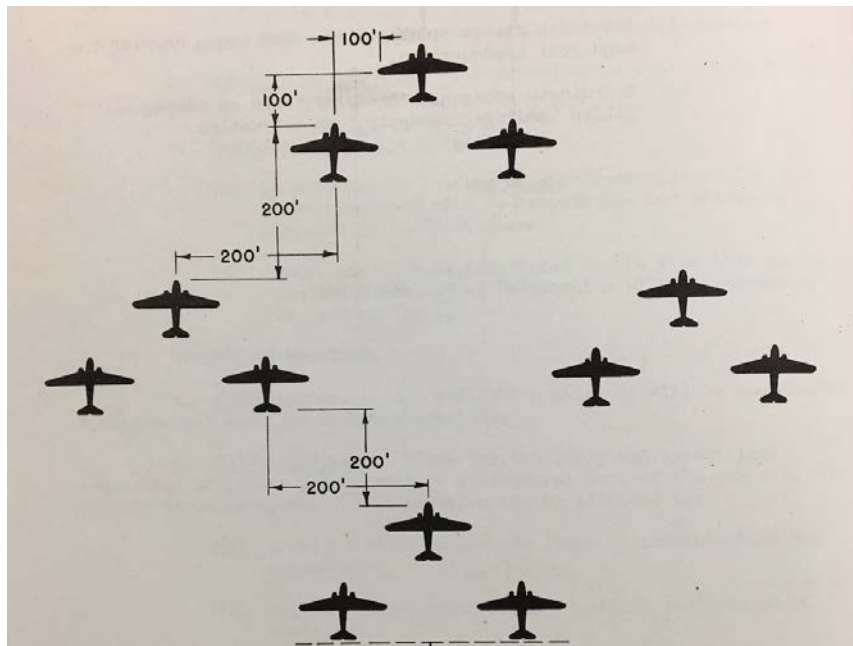


Figure 1. “V” of “Vs” Paratroop Formation

¹⁴⁴ Warren, *Study No. 97*, 33; Martin Wolfe, *Green Light! Men of the 81st Troop Carrier Squadron Tell Their Story* (Philadelphia: University of Pennsylvania Press, 1989), 80.

¹⁴⁵ Warren, *Study No. 97*, 13.

¹⁴⁶ Ninth Air Force, 41; Warren, *Study No. 97*, 33.

Source: U.S. War Department, Army Air Forces Field Manual, *Tactical Doctrine of Troop Carrier Aviation* (Washington, DC: Government Printing Office, 4 September 1945), 58.

To navigate to the DZs, the troop carriers used multiple types of radar and beacon navigation systems. The Pathfinders carried beacons to the DZs along with lights, panels, and smoke for visual DZ identification. The Pathfinder aircraft were all equipped with specialized navigation equipment while only the first and sometimes second aircraft of each remaining serial shared this advantage. All aircraft were employing a receiver used in conjunction with the Pathfinders' beacons. However, fearing signal interference, only the lead aircraft of each nine-ship flight was authorized to use the equipment and that usage was restricted to certain portions of the mission. Other aircraft were only to use their receivers in an emergency.¹⁴⁷ This unnecessarily limited the advantage of having the equipment based on a lack of training on its use and lack of familiarization with how it worked.

British naval vessels would also help the troop carriers find their objectives by marking key navigational points along the route. They would maintain their positions using the same radar and beacon systems employed by the aircraft and would also use visual aids called occults that were basically aerial lighthouses.¹⁴⁸ This idea stemmed from lessons learned during missions to Sicily that were doomed by incorrect navigation.¹⁴⁹ Further naval coordination was driven by other errors experienced in Sicily. Fearing a repeat of that operation's friendly force naval fire on troop carriers,

¹⁴⁷ Warren, *Study No. 97*, 15-17.

¹⁴⁸ *Ibid.*, 15.

¹⁴⁹ *Ibid.*

planners attempted to avoid overflight of the Allied fleet.¹⁵⁰ After some negotiations, the final plan called for a ten-mile wide corridor centered on the route within which aircraft would not be fired upon, similar to the protective corridors still used in some missions.¹⁵¹ This concern, along with fears that the large number of Allied aircraft in operation would overwhelm Identification Friend or Foe (IFF) equipment, led to troop carriers being painted with the now iconic black and white “invasion stripes.”¹⁵²

Although the air effort during the invasion of Normandy was massive, the troop carriers received little direct support, which is fitting in that the airborne was just one part of a much larger operation. However, the IX Troop Carrier Command benefitted from the larger air battle, especially the pre-assault attacks. Starting in April 1944 the Ninth Air Force began using its fighter-bomber and medium bomber aircraft to attack German airfields, rail facilities, communications infrastructure, bridges, coastal batteries, and other targets in direct support of the upcoming invasion.¹⁵³ These attacks continued throughout Operation Overlord with the Ninth Air Force dropping 1,826 tons of munitions on D-Day alone.¹⁵⁴ In addition, Royal Air Force (RAF) 11 Group’s night

¹⁵⁰ Carr, 7.

¹⁵¹ Ibid., 8.

¹⁵² Warren, *Study No. 97*, 12-14.

¹⁵³ Ninth Air Force, 3-12.

¹⁵⁴ Ibid., 59.

fighters provided escort for the troop carriers, attacks on guns and searchlights, and air intercept patrols.¹⁵⁵

Even with this level of air support, the commander of the Allied Expeditionary Air Force, RAF Air Marshal Sir Trafford Leigh-Mallory, wanted to cancel the airborne operation as he expected 75-80 percent losses.¹⁵⁶ The IX Troop Carrier Command planners' estimates were much more optimistic at 16-18 percent loss of airplanes and 6 percent loss of crews. However, Bradley convinced Eisenhower that the airborne operations were vital to the overall ground plan, and Eisenhower agreed.¹⁵⁷

With that decision final, the details were added to the plan. Weather minimums for the airborne mission were set at five miles visibility and ceilings of 4,000 feet over land and 3,000 feet over water.¹⁵⁸ The 50th and 53rd Troop Carrier Wings were tasked to carry the 101st ABN Division, code name Operation Albany, while the 52nd Troop Carrier Wing would perform the drops for the 82nd ABN Division, code name Operation Boston.¹⁵⁹ Airborne and troop carrier planners coordinated air movement tables, communications, briefings, and marshaling while ensuring there were no conflicts with

¹⁵⁵ Ninth Air Force, 42; Warren, *Study No. 97*, 15.

¹⁵⁶ Carr, 8-9; Wolfe, 79.

¹⁵⁷ Wolfe, 79.

¹⁵⁸ Carr, 8.

¹⁵⁹ Wolfe, 90.

the Navy, Air Defense Command, or other Ninth Air Force elements.¹⁶⁰ With the plan set, attention turned to the continued build-up of forces, training, and rehearsals.

The idea behind the Ninth Air Force's assignment to the European Theater of Operations on 16 October 1943 was that it would act as the tactical air force in conjunction with the strategic Eighth Air Force as part of the Bradley Plan dated 28 May 1943.¹⁶¹ In essence, this decision was made with the coming invasion in mind. Therefore, every activity of the Ninth Air Force from 16 October 1943 until 6 June 1944 was part of the build-up and preparations for D-Day including the actions of the IX Troop Carrier Command under its charge.¹⁶² This process accelerated in February 1944 with an influx of experience and new leadership from the Mediterranean Theater of Operations (MTO).¹⁶³

The troop carriers' movement to Europe was an impressive undertaking. From October 1943 to January 1944, the command was "little more than an advance party" with a staff of 100 officers.¹⁶⁴ The arrival of forces then hastened when Gen Williams, former commander of the XII Troop Carrier Command disbanded on 20 February, took command on 25 February. He brought his best personnel with him and all their

¹⁶⁰ Carr, 9.

¹⁶¹ Ninth Air Force, 1.

¹⁶² Ibid.

¹⁶³ Warren, *Study No. 97*, 17-18.

¹⁶⁴ Ibid.

experience gained operating around the Mediterranean.¹⁶⁵ Also arriving from the MTO were the 61st, 313th, 314th, and 316th Troop Carrier Groups under the 52nd Troop Carrier Wing in January and February 1944.¹⁶⁶ During this time period the 53rd Troop Carrier Wing arrived from the United States with the 436th, 437th, 438th, and part of the 439th Troop Carrier Groups under its command.¹⁶⁷ This brought total aircraft to 845 and crews to 760 although by the end of April these numbers increased to 1,062 and 1,076 respectively.¹⁶⁸ By the end of March the IX Troop Carrier Command's remaining forces arrived in the form of the 50th Troop Carrier Wing composed of the 439th, 440th, 441st, and 442nd Troop Carrier Groups bringing the command's total force to three wings with thirteen and one half groups.¹⁶⁹

¹⁶⁵ Ibid.

¹⁶⁶ Ibid., 18.

¹⁶⁷ Ibid.

¹⁶⁸ Ibid.

¹⁶⁹ Ibid., 18, 23.



Figure 2. C-47s in England 1944

Source: Folder GP-314-HI (TR. CARR) August 1944, Air Force Historical Research Agency, Maxwell Air Force Base.

The bed-down plan ensured the Supreme Headquarters Allied Expeditionary Force's 6 February directive to train with airborne force until early May could be met. The combined training program, finalized on 26 February, called for events to begin on 15 March.¹⁷⁰ The troop carriers, therefore, learned to fly in England's harsh weather conditions while also dropping paratroopers and perfecting formation and night flying within weeks, sometimes days, of arrival in the country.

The most intense training taking place was for the Pathfinders and aircrews slated to fly them. The Pathfinder School, later re-designated the First Provisional Pathfinder Group, trained personnel to use the Gee, BUPS, SCR-717C, Eureka, and Rebecca

¹⁷⁰ Ibid., 20.

navigation systems.¹⁷¹ The aircrews were selected from the best of the troop carriers with special attention given to ensure that the most experienced navigators were chosen.¹⁷² These navigators averaged sixty hours of in flight training and fifteen to forty-five hours training with the SCR-717C radar over a sixty-day course.¹⁷³ With this training the crews were expected to be able to drop within fifty yard of their target using only navigational aids on a dark night, and the Pathfinders expected a setup time of three and one half minutes from aircraft exit.¹⁷⁴ The equipment would then allow the larger formations following thirty minutes behind to drop accurately.

The larger force was also engaged in training and rehearsal for Operation Neptune. Luckily, enough emphasis was placed on Operation Neptune that the troop carriers' operational missions were light with only some patient evacuation and freight transportation missions flown.¹⁷⁵ This allowed them to focus on the coming mission and their airdrop tactics. They used the time to practice "new formations, flying in blackout, and just finding their way around a country where marginal weather was a rule rather

¹⁷¹ Carr, 5; Warren, *Study No. 97*, 24-25

¹⁷² Ninth Air Force, 41; Wolfe, 59.

¹⁷³ Warren, *Study No. 97*, 25.

¹⁷⁴ Martin L. Ernst, "Preliminary Report on Trials of Radio Navigational Aids Used in Troop Carrier Operations," 11 November 1943, U.S. Army: Unit Records, 1917-50, 82nd Airborne Division, 1943-1946, Box 6, Dwight D. Eisenhower Presidential Library, 1.

¹⁷⁵ Assistant Chief of Air Staff, Intelligence, "Army Air Forces Historical Studies: No. 32, Ninth Air Force in the ETO 16 Oct 1943 to 16 Apr 1944" (Air Staff Historical Division, Washington, DC, May 1945), 98.

than an exception.”¹⁷⁶ Planners analyzed these missions to update the plan and operating procedures to ensure success on D-Day.¹⁷⁷ Throughout preparations, the 52nd Troop Carrier Wing worked with the 82nd ABN Division and the 53rd worked with the 101st, matching the Operation Neptune drops.¹⁷⁸ Due to distance between staging bases, the 50th was unable to work with the 101st until late April.¹⁷⁹ From January to early March, the crews flew in group and wing missions at times as small as eight aircraft and as large as fifty.¹⁸⁰ Moving into April and May the preparatory events grew larger and more intense.¹⁸¹ The 50th continued a robust schedule until 29 May with simulated drops due to the 101st completing its practice jumps and flying day and night because their training did not start until April.¹⁸²

One final large-scale pre-invasion event, exercise Eagle, tested the ability of the IX Troop Carrier Command. On the night of 11-12 May, the command’s three wings and the two airborne divisions flew a rehearsal as close to the actual mission as possible. Nineteen serials carrying the 101st ABN Division and nine serials of 82nd paratroopers followed seven Pathfinder serials into a hazy sky with visibility as low as three miles.¹⁸³

¹⁷⁶ Carr, 9.

¹⁷⁷ Ibid., 10.

¹⁷⁸ Warren, *Study No. 97*, 21.

¹⁷⁹ Ibid., 24.

¹⁸⁰ Assistant Chief of Air Staff, Intelligence, 100.

¹⁸¹ Ibid., 100-101.

¹⁸² Warren, *Study No. 97*, 23-24.

¹⁸³ Ibid., 25-26.

Although not the full force of aircraft and airborne for Operation Neptune, nearly 7,000 jumpers participated carried by 822 aircraft.¹⁸⁴ During the exercise, the 440th Troop Carrier Group of the 50th Wing fell out of formation and failed to drop.¹⁸⁵ The 52nd Wing also had issues as its 442nd Group lost formation integrity and only sixteen of its forty-five aircraft flew to the drop and those missed the DZ by ten miles.¹⁸⁶ The 52nd's 314th had nine crews fail to drop with the rest needing two passes over the DZ, and the 315th did not drop at all.¹⁸⁷ Even with these failures, Air Marshal Leigh-Mallory was impressed with the rehearsal and Williams predicted that "90-100 percent of the paratroops in IX Troop Carrier Command's Normandy mission would land in the correct area" unless there was "unexpectedly heavy flak or failure by the pathfinders."¹⁸⁸

With exercise Eagle complete, final orders were drafted and maps were distributed. Briefings were held from the wing level down to the individual crew.¹⁸⁹ The IX Troop Carrier Command would soon see its first combat action.

Tactics and Theory

Operation Neptune was the scenario envisioned by Army planners developing the ideas for the use of the airborne forces. The areas behind the French coast offered open

¹⁸⁴ Ibid.

¹⁸⁵ Ibid., 26.

¹⁸⁶ Ibid.

¹⁸⁷ Ibid.

¹⁸⁸ Ibid.

¹⁸⁹ Ibid., 27.

DZs in which to deliver large quantities of paratroopers at night with air support available before, during, and after the jump.¹⁹⁰ Neptune also matched the ongoing large-scale training in America that used division-sized airdrops at night in blackout conditions.¹⁹¹ It seems as if Normandy proved airborne theorists' ideas were accurate.

Normandy being the theoretically ideal area for airborne is not surprising based on how America developed its views on parachute assault operations during World War II. United States Army airborne and troop carrier planners learned from three key sources before the invasion of Normandy. One was the German *Fallshirmjäger* assaults in Norway, Holland, and Belgium in 1940.¹⁹² The second was the multiple large-scale joint training maneuvers taking place in America from 1942 to 1944.¹⁹³ The third was the operational experience of American paratroopers and troop carriers gained in three North African drops in 1942, the drop on Sicily in July 1943, and three drops near Salerno, Italy in September 1943.¹⁹⁴ These operations showed either the benefits of jumping into large, open fields or the negative consequences of choosing other terrain upon which to land

¹⁹⁰ Ninth Air Force, 3-12, 45-63; U.S. War Department, Field Manual, (FM) 31-30, *Tactics and Technique of Air-Borne Troops* (Washington, DC: Government Printing Office, May 1942), 34.

¹⁹¹ F. W. Evans and Leo Donovan, "Combined Airborne-Troop Carrier Maneuver January 5-9, 1944," after action report, 1944, Camp Mackall, NC, Airborne Troop Carrier Maneuver Headquarters, 2.

¹⁹² Huston, 90.

¹⁹³ Huston, 133-138; Williams and Donovan, 1-2.

¹⁹⁴ Carr, 7; Huston 151, 157, 166-169; Warren, *Study No. 97*, 15.

such as mountains along with other lessons such as the importance of air support and joint planning.

Operation Neptune also fit the enduring principle of airborne employment calling for combat aviation support. This principle was an essential factor for the troop carriers since they lacked defensive systems and armament.¹⁹⁵ Although today's airlift has some defensive systems, the need for supporting air assets remains in doctrine. The troop carriers not only benefited from their assigned escorts but also from the preparatory air support provided by the Eighth and Ninth Air Forces after the Combined Chiefs of Staff gave Eisenhower control of the Eighth Air Force beginning on 1 April 1944.¹⁹⁶ The suppression of enemy air defenses planned before and during the assault was a key factor in the ability of the troop carriers to make it to their objectives and their ability to plan for large formations without interference.

Low altitude flight was also planned to avoid enemy interference. By flying low altitudes and route planning to avoid enemy defenses, the troop carriers maintained the element of surprise as long as possible by evading detection by radar or visual acquisition.¹⁹⁷ Visual detection was also avoided by flying at night with minimal

¹⁹⁵ U.S. War Department, Field Manual, (FM) 31-35, *Aviation in Support of Ground Forces* (Washington, DC: Government Printing Office, April 1942), 33.

¹⁹⁶ Wesley R. Craven and James L. Cate, *The Army Air Forces in World War II*, vol. 3 (Washington, DC: Office of Air Force History, 1983), 81-82, accessed 24 August 2016, <http://media.defense.gov/2010/Nov/05/2001329888/-1/-1/0/AFD-101105-007.pdf>; Williamson Murray and Allan R. Millett, *A War to be Won: Fighting the Second World War* (Cambridge, MA: Harvard University Press, 2000), 413.

¹⁹⁷ Carr, 12.

lighting.¹⁹⁸ While low altitude flight is not specifically mentioned in published guidance, surprise and avoidance of enemy fire are discussed often.¹⁹⁹ Although necessary, low-altitude, night flying is difficult. The difficulty was further increased by the need to use formation tactics during the operation.

The “V” of “Vs” formation was another important part of troop carrier tactics. It allowed a smaller grouping of aircraft and shorter overall formation length than a trail formation. This reduced exposure to the enemy during the airdrop, the most vulnerable part of the mission, and aided escort operations by limiting the escorts’ area of concern and time needed to protect the airdrop package. It also benefitted the paratroopers by providing better mass on the objective and kept units together even if dropped at the wrong location.²⁰⁰ The formation type was enabled by drop environment, however, because it required DZs wide enough to accept a more spread out drop pattern.

In order to aid the formation and drop pattern, the troop carriers were ordered to maintain level flight and not take evasive actions if encountering enemy fire over the DZs.²⁰¹ This also matched the guidance for the pilot to “maintain prescribed altitude,

¹⁹⁸ Ibid.

¹⁹⁹ U.S. War Department, Field Manual, (FM) 100-5, *Field Service Regulation: Operations* (Washington, DC: Government Printing Office, 22 May 1941), 245-246; U.S. War Department, FM 31-35, 33-34; U.S. War Department, FM 31-30, 32-33.

²⁰⁰ Gavin, 3-4; U.S. War Department, FM 31-35, 34-35.

²⁰¹ Warren, *Study No. 97*, 59.

attitude and speed” during the drop found in the standard operating procedure.²⁰²

Avoiding evasive maneuvers would aid paratrooper exit from the aircraft and also help the pilots to maintain formation position. Both would allow the dispersion of airborne troops on the ground to be predictable.

Based on the theory guiding troop carrier operations, the entire mission should have been predictable, and the majority of the tactics are still practiced. The airlift plan followed all of the prevailing wisdom regarding paratrooper drops gleaned from airborne doctrine and lessons learned in North Africa, Sicily, and Italy. The lessons were incorporated from how the mission was planned to the routes selected and use of navigational aids and even to the training conducted before the operation.²⁰³ The objective area offered excellent DZs, and the plan integrated the efforts of other aviation assets in order to allow the troop carriers to safely complete their task.²⁰⁴ Operation Neptune was planned in a way that conforms to tactics and doctrine still used. The troop carriers also trained with the paratroopers in England and had no other missions to remove focus from the airdrop, advantages unlikely in today’s military. However, the

²⁰² Supreme Headquarters Allied Expeditionary Force, “Standard Operating Procedure for Airborne and Troop Carrier Units,” 13 March 1944, Combined Arms Research Library, Fort Leavenworth, KS, R-15037, 6.

²⁰³ Kermit T. Hanson, “Mission Doctrine and Principles of Employment,” October 1944, Orlando, FL, Army Air Forces Tactical Center, Army Air Forces School of Applied Tactics, 10-11.

²⁰⁴ Salve H. Matheson, “The Operations of the 506th Parachute Infantry (101st Airborne Division) in the Normandy Invasion, 5-8 Jun 1944 (Normandy Campaign) (Personal Experience of a Regimental Staff Officer)” (Monograph, Advanced Infantry Officers Course, Fort Benning, GA, 1950), 16.

troop carriers, three fourths of them flying their first combat missions, were about to face the friction of war.²⁰⁵

Execution

On the night of 5 June 1944, the nearly four months of troop carrier planning transitioned from ideas to action. At fifteen locations in southern England, troop carrier crews performed pre-flight checks, and paratroops strapped on their equipment and boarded aircraft. Then the engines of 1,143 troop carrier aircraft awoke in the darkness.²⁰⁶ Of these, 822 were tasked with the paratroop drops.²⁰⁷ As per the plan the twenty Pathfinders took off first with takeoff times around 2200 local time.²⁰⁸ Operation Albany's 432 aircraft filled with the 101st ABN Division and Operation Boston's 369 planes with the 82nd ABN Division followed starting at 2232.²⁰⁹

²⁰⁵ Warren, *Study No. 97*, 59.

²⁰⁶ Ninth Air Force, 44.

²⁰⁷ Warren, *Study No. 97*, 224; Paul L. Williams, IX Troop Carrier Command Report of Operation (Neptune), 13 June 1944, Folder 546.452G 13 June 1944, Air Force Historical Research Agency, Maxwell Air Force Base, 6.

²⁰⁸ USAF Historical Liaison, 43; Ninth Air Force, 41-42; Warren, *Study No. 97*, 32-33.

²⁰⁹ Warren, *Study No. 97*, 35.



Figure 3. Paratroopers enter a C-47

Source: Folder GP-314-HI (TR. CARR) August 1944, Air Force Historical Research Agency, Maxwell Air Force Base.

The takeoff went well. Only one aircraft failed to takeoff, and it was due to damage from a paratrooper's grenade in the cargo compartment.²¹⁰ By 0002 on 6 June 1944, the other 820 had all departed for France.²¹¹ The formations assembled and flew the route according to the plan and with the navigational aids working well.²¹² Making the turn toward the French shore, the crews easily identified the coastline and their Initial

²¹⁰ Ibid., 48.

²¹¹ Ibid.

²¹² Ninth Air Force, 43.

Points.²¹³ However, crossing the coast the C-47s entered a thick cloudbank that extended ten to twelve miles.²¹⁴ This turned the situation from a beautiful, moonlit night to conditions making it nearly impossible to keep formation.

As the crews attempted to fly towards their objective areas, the clouds thickened as the troop carriers flew on causing them to increase formation spacing.²¹⁵ The flak was also thickening as the aircrews approached the DZs. This caused more loss of formation integrity as some crews chose to take evasive actions and maneuvered in response to enemy ground fire.²¹⁶ The *Luftwaffe* also attacked the formations with night fighters, adding another source of confusion and impetus causing poor formation flight.²¹⁷ All of these factors combined to cause “tragic dispersion at the drop zones.”²¹⁸

For many aircraft the ability to fly within planned drop parameters was also tragic. When the troop carrier pilots dove, climbed, maneuvered, and accelerated to avoid enemy fire and other aircraft many failed to return to the prescribed speeds and altitudes

²¹³ Warren, *Study No. 97*, 36.

²¹⁴ Ibid.

²¹⁵ Kindig, 18; Salve H. Matheson, 15.

²¹⁶ Robert Abraham, “The Operations of the 508th Parachute Infantry (82d Airborne Division) Normandy, France, 5-10 June 1944 (Normandy Campaign) (Personal Experience of a Regimental Demolition Officer)” (Monograph, Advance Infantry Officers Course, Fort Benning, GA, 1948), 11; Kindig, 18; Matheson, 15.

²¹⁷ Abraham, 11; John T. Joseph, “The Operations of a Regimental Pathfinder Unit, 507th Parachute Infantry Regiment (82nd Airborne Division) in Normandy, France 6 June 1944 (Normandy Campaign) (Personal Experience of a Regimental Pathfinder Leader)” (Monograph, Advanced Infantry Officers Course monograph, Fort Benning, GA, 1948), 19.

²¹⁸ Joseph, 19.

for the drop. Aircraft altitudes during jumper exit ranged from 300 to 3,000 feet Above Ground Level, and some crews maintained excessive speed during green light.²¹⁹ In the chaos pilot turned the green light on early or the red light late, further reducing drop success.²²⁰ Still, most aircraft were able to deliver their paratroopers.



Figure 4. Paratrooper Prepares to Jump

Source: Folder 546.072A, Air Force Historical Research Agency, Maxwell Air Force Base.

The first paratroopers delivered to the objective area, the Pathfinders, were mostly dropped outside of the accuracy prescribed in mission directives as only two of six serials were within tolerance.²²¹ However, all were close enough to their DZs and successfully

²¹⁹ Abraham, 11; Joseph, 19.

²²⁰ Joseph, 20.

²²¹ Warren, *Study No. 97*, 33.

completed their missions.²²² Other paratroopers were not as lucky. Only one tenth were delivered to their planned DZ, 25 to 30 percent landed within one mile, 15 to 20 percent were one to two miles off target, and 55 percent were 2 miles or closer.²²³ These turned out to be the lucky ones. Another 25 percent were two to five miles off DZ, one tenth landed five to ten miles away, 4 percent found themselves ten to twenty-five miles off mark, and 6 percent were not accounted for.²²⁴

The large numbers dropped far from their intended DZs may have been partially due to a lack of understanding between airborne and troop carrier commanders. Troop carriers were ordered to deliver the paratroopers “within the combat area” if they missed their DZ on the first pass.²²⁵ Furthermore, their orders directed flying to and dropping on DZ D if they reached the coastline with paratroopers still on board.²²⁶ The intent of this direction was to ensure that all airborne soldiers were on the European continent before the troop carriers returned to their home stations. By ordering to drop in the “combat area” or on a DZ that may not have been the planned target, the troop carrier leadership implied that drop accuracy was not as important as drop accomplishment and displayed a lack of appreciation for the needs of the airborne units. Furthermore, dropping in this manner negated the advantage of massing on the objective area.

²²² Ibid.

²²³ Ibid., 58.

²²⁴ Ibid.

²²⁵ Williams, IX Troop Carrier Command Field Order No. 1, 5.

²²⁶ Ibid.

A lack of trust in the troop carriers also negatively influenced the drop. Although it is undeterminable who may or may not have been correct, disputes occurred during the jump between pilots and jumpmasters. Some told aircrews to turn off the green jump light when it was turned on and many questioned the speed and altitudes of the drops.²²⁷ One disagreement resulted in a crew making three passes over the DZ. During the second pass, the aircraft was hit by flak and on the third the paratroopers jumped only after being told there would be a forced landing. As the last jumper exited, both engines failed and the crew landed in a field.²²⁸ These types of disputes cannot happen in an airborne operation and will not if trust exists between paratroopers and aircrews. However, each community still questions each other's requests and methods during exercises today.

Overall, responsibility for the poor accuracy and wide dispersion rests on the shoulders of the troop carrier crews. As a result, ground assembly took an excessive amount of time and was nearly impossible.²²⁹ The inability of landed troops to find their units or other Americans caused by the poor drop performance put the airborne mission in jeopardy. As one paratrooper described it, "The hours between landing and daylight were hours of loneliness, confusion, danger, and death."²³⁰ Had the troop carriers

²²⁷ Debriefing Conference-Operation Neptune, meeting transcript, 13 August 1944, Combined Arms Research Library, Fort Leavenworth, KS, N-12198, 1-2.

²²⁸ Harrison Loesch, "Narrative Statement of the Crew of A/C #42-93002, 62nd TC Sq, 314th TC Gp, in Connection with Events of Bigot-Neptune #1," 14 June 1944, Folder SQ-TR-CARR-62-HI Jun 44, Air Force Historical Research Agency, Maxwell Air Force Base, 1-2.

²²⁹ Joseph, 20-21.

²³⁰ Kindig, 18.

dropped more accurately in the early morning hours of 6 June 1944, the paratroopers would have landed as a capable fighting force instead of scattered soldiers trying to piece together makeshift units and launching makeshift attacks.

Results

The troop carriers returned to their bases believing their performance in Operations Neptune was outstanding. They had sustained few losses and most crews reported a successful drop. However, Maj. Gen. Elwood “Pete” Quesada, the Ninth Air Force Commander, brought news from Normandy on 10 June that Bradley was disappointed with the dispersion of the drop.²³¹ Other key leaders were more approving. The Commanding General of U.S. Strategic and Tactical Air Forces, Gen. Carl “Tooey” Spaatz, congratulated the IX Troop Carrier Command for “results far beyond expectations.”²³² Maj. Gen. Matthew Ridgway, Commanding General of the 82nd ABN Division, was also pleased with the troop carriers’ “coolness under fire” and ability to work with his airborne troops.²³³ He also mentioned that his division was able to secure its objectives within hours of landing.²³⁴ This is an impressive feat considering that

²³¹ Warren, *Study No. 97*, 58.

²³² O. W. Howland, Memorandum to IX Troop Carrier Command Subject: Message from Commanding General, USSTAF, 16 June 1944, Folder SQ-TR-CARR-62-HI Jun 44, Air Force Historical Research Agency, Maxwell Air Force Base.

²³³ M. B. Ridgway, Letter to Paul Williams, Commanding General, IX Troop Carrier Command, 8 June 1944, Folder SQ-TR-CARR-62-HI Jun 44, Air Force Historical Research Agency, Maxwell Air Force Base.

²³⁴ *Ibid.*

division only had approximately 1,500 troops near the objectives four hours after the drop and control of roughly 2,000 by midnight.²³⁵

The 101st ABN Division had similar numbers near their objective: 1,100 men, at the four-hour mark and about 2,500 by midnight.²³⁶ In other words, at midnight approximately 4,500 of 13,215 paratroopers dropped were assembled even though more than 10,000 landed within five miles of their DZs.²³⁷ These numbers tell the same story as the individual accounts of small unit leaders whose views of the drop were not as positive as those of the generals. These men reported the dispersion as detrimental to assembly when combined with enemy fire, darkness of the night, and confusion of combat.²³⁸ The difficulty of moving through the Normandy hedgerows and swamps added additional time to assembly.²³⁹ Commanders of battalion-sized and larger units also observed these factors and added that not all units followed the planned assembly procedures, further slowing the process.²⁴⁰

²³⁵ Warren, *Study No. 97*, 58.

²³⁶ Ibid.

²³⁷ Warren, *Study No. 97*, 58; Paul L. Williams, IX Troop Carrier Command Report of Operation (Neptune), Incl. 13 (USAAF Form 34-C), 13 June 1944, Folder 546.452G 13 June 1944, Air Force Historical Research Agency, Maxwell Air Force Base, 2.

²³⁸ Abraham, 12-13; Kindig, 19; Matheson, 16-17.

²³⁹ Weapons Systems Evaluation Group, "WSEG Staff Study No. 3: A Historical Study of Some World War II Airborne Operations," Combined Arms Research Library, Fort Leavenworth, KS, N-17309.1, 37-38; Warren, *Study No. 97*, 58.

²⁴⁰ Debriefing Conference-Operation Neptune, 12.

Delayed assembly is a serious factor as it negates the mass employment of forces, a key objective in any large-scale airborne insertion.²⁴¹ Furthermore, once the first troops jump the element of surprise is lost and any delays in action allow the enemy to organize defenses against the isolated airborne force. Also, paratroopers are most vulnerable from the time they exit the aircraft until they are assembled.²⁴² Assembly is greatly affected by drop geometry. Even with the other factors, accuracy and concentration during the drop have the most significant influence on assembly time.²⁴³ Therefore, the dispersion of airborne forces put their mission at great risk.

The troop carriers' effect on the airborne portion of Operation Neptune could have been devastating. Some units took over four hours to begin movement and were still only partially reorganized because of the drop.²⁴⁴ However, the Germans failed to use the scattered drop to their advantage. If they had, it could have jeopardized the entire airborne mission.²⁴⁵ Instead, the paratroopers succeeded despite the unforeseen challenges caused by the drop. The 101st ABN Division was able to secure the western edge of Utah Beach and enabled the amphibious invasion force's move inland.²⁴⁶ The 82nd ABN Division also secured its objectives including the capture of Ste. Mere-

²⁴¹ Joseph, 21.

²⁴² Department of the Army, Pamphlet No. 20-232, *Airborne Operations: A German Appraisal* (Washington, DC: Government Printing Office, October 1951), 31.

²⁴³ Weapons Systems Evaluation Group, 48.

²⁴⁴ Debriefing Conference-Operation Neptune, 1.

²⁴⁵ Matheson, 17.

²⁴⁶ USAF Historical Liaison, 48.

Eglise.²⁴⁷ Therefore, the troop carriers' mission was a success despite their imperfect performance.

The IX Troop Carrier Command's performance included 1,662 dispatched sorties with 822 aircraft assigned to drop paratroopers, 821 of which took off.²⁴⁸ The C-47s and C-53s brought 13,215 of 13,428 paratroopers to the fight with 4,062 arriving via glider.²⁴⁹ The IX Troop Carrier command also delivered 1,641,448 pounds of cargo, 281 jeeps, and 333 artillery pieces.²⁵⁰ There was also a cost associated with the mission. The troop carriers had 43 aircraft destroyed or mission, 2.57 percent of the sorties flown.²⁵¹ Another 449 aircraft returned damaged by the enemy.²⁵² Like their aircraft, the troop carrier personnel did not make it through Operation Neptune unscathed. Twenty-seven men were killed, 327 missing, and fifty wounded.²⁵³ Although hundreds of men and aircraft were hit by the enemy during the operation, this fell well short of the predictions of both pessimistic leadership and optimistic mission planners.²⁵⁴ The lower than expected combat losses helped the tactics, such as low altitude flight, used in Normandy to be cemented in airlift doctrine.

²⁴⁷ Ridgway, Letter to Williams; USAF Historical Liaison, 48.

²⁴⁸ Warren, *Study No. 97*, 224; Williams, Report of Operation Incl. 13, 2.

²⁴⁹ Williams, Report of Operation Incl. 13, 2.

²⁵⁰ Ninth Air Force, 44-45; Williams, Report of Operation Incl. 13, 2.

²⁵¹ Williams, Report of Operation, 6.

²⁵² Ninth Air Force, 44.

²⁵³ Williams, Report of Operation Incl. 13, 3.

²⁵⁴ Carr, 8-9; Wolfe, 79.

In terms of losses the IX Troop Carrier Command outperformed expectations. The success of the troops they delivered is another indication of a job well done. However, there were losses during the mission and the drops fell well short of expectations for both accuracy and concentration. Both of these factors indicate that the troop carriers could have planned and executed a better mission. However, it is unlikely that today's doctrine would drive a different plan, largely because of its reliance on Normandy as an example.

Normandy showed the tactical advantages and risks of night operations, low altitude flight, and weather. It also taught the risk of unfamiliar equipment. Two other lessons from Normandy are the importance of an integrated air plan and creating a shared understanding of purpose between airlifters and paratroopers. In assessing the operation two months after its completion, airborne leadership made few recommendations for changes in the tactics used but repeatedly suggested improvements focused on better cooperation and understanding between the airborne and troop carriers.²⁵⁵ Some of these lessons have endured in modern airlift doctrine while others have not.

²⁵⁵ Debriefing Conference-Operation Neptune, 1-7.



Figure 5. A C-47 Lands in England

Source: Folder GP-314-HI (TR. CARR) August 1944, Air Force Historical Research Agency, Maxwell Air Force Base.

CHAPTER 4

CORREGIDOR

Planning and Preparation

On the night of 5 May 1942 two battalions of Japanese under the command of Col Gempachi Sato conducted an amphibious assault on Corregidor Island.²⁵⁶ Their mission ended the resistance of approximately 3,900 men and culminated Gen Masaharu Homma's six-month advance through the Philippines.²⁵⁷ The next day, Lt Gen Jonathan M. Wainwright, the American commander, surrendered the island and what remained of the men previously commanded by Gen Douglas MacArthur.²⁵⁸

Almost three years later, the Americans decided it was time to take back Corregidor. Then-Lt Gen George C. Kenney suggested heavily bombarding the island before its recapture by paratroopers; MacArthur agreed.²⁵⁹ The Thirteenth Air Force started the bombing on 23 January 1945.²⁶⁰ Twelve days later, Sixth Army planners forwarded their concept for the operation to MacArthur's headquarters and received his

²⁵⁶ John R. Galvin, *Air Assault: The Development of Airmobile Warfare* (New York: Hawthorn Books, 1969), 217-218.

²⁵⁷ Ibid.

²⁵⁸ Gerard M. Devlin, *Paratrooper! The Saga of U.S. Army and Marine Parachute and Glider Combat Troops during World War II* (New York: St. Martin's Press, 1979), 578-579.

²⁵⁹ George C. Kenney, *General Kenney Reports: A Personal History of the Pacific War* (New York: Duell, Sloan and Pearce, 1949), 519.

²⁶⁰ Carl A. Damberg, "Airborne Operation Corregidor," after action report, 1945, Headquarters 317th Troop Carrier Group, Combined Arms Research Library, Fort Leavenworth, KS, N-11138, 7.

approval.²⁶¹ Airborne planners started initial work on 10 February 1945²⁶² and the Sixth Army Chief of Staff, Lt Col John J. Tolson, alerted the 503rd PIR Commander, Col George M. Jones to be ready to take Corregidor by parachute assault.²⁶³

Jones heeded the forewarning and surveyed the island for suitable DZs from inside an American bomber.²⁶⁴ This flight allowed him to choose two DZs for the operation. The first, designated DZ “A,” was a parade ground measuring roughly 1,500 feet long and varying from 200 to 700 feet in width.²⁶⁵ The second, DZ “B,” was a golf course assessed to be approximately 1,500 feet long with widths varying from 450 to 700 feet.²⁶⁶ The 317th Troop Carrier Group began planning and by 13 February the group issued operations instructions to their aircrews of the role they were going to play in the upcoming battle.²⁶⁷

Issuing orders in this short timeframe for an air mission as complex as Corregidor with its small DZs, air integration requirements, and paratrooper coordination, is an

²⁶¹ Edward M. Flanagan, Jr., *Airborne: A Combat History of American Airborne Forces* (New York: Ballantine Publishing Group, 2002), 319.

²⁶² U.S. War Department, “Reduction in Time Factor in Launching an Airborne Operation,” staff memorandum, General Staff G-3 (Washington, DC: War Department General Staff Training Division, 1946), 5.

²⁶³ Flanagan, 319.

²⁶⁴ Galvin, 220.

²⁶⁵ Damberg, 1.

²⁶⁶ *Ibid.*

²⁶⁷ Fred H. Schomburg, Jr., “Operations Instructions No.1,” operations instructions, 13 February 1945, Headquarters 317th Troop Carrier Group, Combined Arms Research Library, Fort Leavenworth, KS, N-11138, 1.

astonishing feat. The 317th Troop Carrier Group staff and pilots worked closely with the 503rd PIR. The 317th personnel attended all 503rd briefings and openly offered planning suggestions.²⁶⁸ The close bond between the units was also reflected in the frequent and personal visits between Jones and Lt Col John Lackey, 317th Troop Carrier Group Commander.²⁶⁹ Furthermore, the two units had operated together on previous missions and developed a trusting and friendly working relationship.²⁷⁰

Integration between air and ground further enabled detailed planning and preparation of the mission by use of the bomber flights taking place before the assault. Flying aboard these aircraft, commanders of regiments and battalions making the jump along with some staff officers got to visually reconnoiter their objective areas.²⁷¹ On later, similar sorties all paratroopers slated to act as jumpmasters made reconnaissance flights to survey the terrain and orient themselves with their “go point,” a terrain feature that the jumpmaster would use as reference.²⁷² Jumpmasters’ preparation also included

²⁶⁸ Donald A. Crawford, “Operations of 503d Parachute Regimental Combat Team in Capture of Corregidor Island 16 February–2 March 1945 (Northern Philippines Campaign)” (Monograph, Advanced Infantry Officers Course, Fort Benning, GA, 1949), 14.

²⁶⁹ Edward T. Flash, “The Operations of the 2d Battalion, 503d Parachute Infantry Regimental Combat Team in the Recapture of Corregidor Island, 16 February–23 February 1945 (Luzon Campaign)” (Monograph, Advanced Infantry Officers Course monograph, Fort Benning, GA, 1950), 8.

²⁷⁰ John H. Blair, III, “Operations of the 3d Battalion, 503d Parachute Infantry Regiment in the Landing on Corregidor, P.I., 16 February–2 March 1945 (Luzon Campaign)” (Monograph, Advanced Infantry Officers Course, Fort Benning, GA, 1950), 9.

²⁷¹ Crawford, 11.

²⁷² Blair, 8.

unit assembly practice following a practice spot jump from 500 feet of altitude as a final training requirement.²⁷³

The measures taken to acquaint personnel, including aircrew, with the island also included having men available for questioning who served on Corregidor before the war.²⁷⁴ This even included a Major General who served as an artillery officer in 1942 before being captured by the Japanese addressing the 503rd PIR to provide critical information about terrain and key locations on the island.²⁷⁵ The amount of detailed and focused planning, especially concerning terrain, highlights the operation's complexity caused by the island's size: Corregidor is a small, tadpole-shaped island measuring 7,000 yards long with the "head," known as Topside, having a diameter of 2,300 yards.²⁷⁶

The 317th Troop Carrier Group tasked the 39th, 40th, 41st, and 46th Troop Carrier Squadrons to fly the mission with the 65th and 66th Troop Carrier Squadrons providing three aircraft for use by the 46th.²⁷⁷ Aircraft availability, troops and cargo needed, and flight distance dictated much of the airlift plan.²⁷⁸ It was further limited by wind direction and speed and the size of the DZs.²⁷⁹ With these factors taken into

²⁷³ Flash, 10.

²⁷⁴ Crawford, 14.

²⁷⁵ Flash, 8.

²⁷⁶ Ibid., 6.

²⁷⁷ Shomburg, 2-3.

²⁷⁸ Blair, 9; Crawford, 17.

²⁷⁹ Blair, 10.

consideration, the 317th planned to fly the initial phases of the operation in three lifts. The first two included 51 C-47s on 16 February 1945 with a third lift comprised of 43 aircraft the next day.²⁸⁰ A fourth lift was prearranged for resupply on 17 February.²⁸¹

The C-47s flew in a “V” of “Vs” formation leaving from Hill and Elmore Airfields on Mindoro Island then reformed into 600-foot trail formation passing Lubang Island.²⁸² Put simply, aircraft flew in groups of three with one aircraft aft and left of the lead airplane and another aft and right to form the first “V.” Two other “Vs” flew aft of the lead “V,” one left and one right, creating a flight of nine C-47s in a “V” of “Vs” formation. The aircraft then lined up one behind the other with 600 feet between each plane. The aircraft would maintain trail throughout the drop operations. From trail formation, the serials planned to form into parallel columns in order to drop on both DZs simultaneously, the left column targeting DZ “A” and the right dropping on DZ “B.”²⁸³ The proximity of the DZs, nearly 500 yards, limited aircraft using DZ “A” to a left-hand pattern and DZ “B” aircraft to a right-hand pattern.²⁸⁴ This was an important de-confliction measure because the plan called for nine paratroopers to be dropped on each pass.²⁸⁵ Therefore, aircraft needed to make two or three passes to drop their entire load.

²⁸⁰ Shomburg, 1.

²⁸¹ Ibid.

²⁸² Damberg, 3.

²⁸³ Blair, 10; Flash, 9.

²⁸⁴ Damberg, 3; Galvin, 220.

²⁸⁵ Schomburg, 1.

During each pass the C-47 pilots would fly over their “go point;” however, they would not turn on the green light over the point, instead counting to adjust for the expected strong winds over the objective area.²⁸⁶ Pre-flight planning set the count at three seconds, but adjustments were expected.²⁸⁷ Orders made it clear that pilots would ensure the red light was turned on after each drop to prepare for the next pass.²⁸⁸ Pilots were also prepared to receive instructions to change drop altitude, delay green light, hold for smoke clearance over the DZ, adjust right or left of the DZ, halt drops, or hold away from the island awaiting further orders.²⁸⁹ This thorough contingency planning proved useful during the actual operation.

The additional precaution of employing a command plane allowed the contingency planning to be effective. Lackey piloted the C-47 with his Operations Officer, Capt Max W. Custer, acting as his co-pilot.²⁹⁰ They carried Jones and Tolson in order to consult between the four officers and give adjustments to the aircrews performing the drops.²⁹¹ By staying above the objective area, the command plane could maintain radio contact with the troop carriers.²⁹² Jones and Tolson would then be dropped

²⁸⁶ Damberg, 3.

²⁸⁷ Ibid.

²⁸⁸ Schomburg, 2.

²⁸⁹ Ibid.

²⁹⁰ Damberg, 3.

²⁹¹ Ibid.

²⁹² Blair, 11.

into the battle when “the paratroopers were satisfactorily getting into the drop zones.”²⁹³ This unified effort between commanders addressed a lesson learned in Normandy that should still influence today’s airlift and airborne communities.

The 317th planned all passes to occur at 100 miles per hour (mph) and 1,150 feet mean sea level (MSL) or 650 feet AGL.²⁹⁴ This gave a planned “green light time,” or time over the DZ, of ten seconds.²⁹⁵ With these timing factors, one lift would need over an hour to drop the battalion they carried.²⁹⁶ The 140-mile flight to the objective area, time to drop, 140 miles back to Mindoro Island, and time to upload the second lift meant that the first aircraft would be over the DZ from 0830 to approximately 0930 local time and the second lift’s first paratrooper would not exit the aircraft until 1230.²⁹⁷ During those three hours the battalion would be left alone to secure the DZs²⁹⁸ and combat the estimated 850 Japanese soldiers on the island.²⁹⁹ These altitudes and speeds show the applicability to today’s airlift tactics. Their similarities show why lessons from World War II still apply. Furthermore, the timing influenced the integration capabilities, a factor forgotten in when planning some of today’s airborne exercises. The second lift would

²⁹³ Damberg, 3.

²⁹⁴ Ibid., 2.

²⁹⁵ Ibid.

²⁹⁶ Blair, 10; Crawford, 21.

²⁹⁷ Damberg, 5.

²⁹⁸ Galvin, 221.

²⁹⁹ Blair, 11.

then reinforce the Americans sufficient to await the third and fourth missions to follow on 17 February.

The drops on 16 February were not performed with only airlift and airborne units. The bombardment, which began on 23 January with twenty Thirteenth Air Force B-24s and sixteen A-20s from the Fifth Air Force bombing and strafing Corregidor, had increased steadily in preparation for the jump.³⁰⁰ In a three-week time frame, the Fifth Air Force provided 696 sorties of B-24, A-20, and fighter-bomber aircraft dropping a variety of weapons in order to prepare the island for assault.³⁰¹ The Thirteenth Air Force added sorties dropping 1,425 tons of munitions.³⁰²

The U.S. Navy also participated in preparing the island for assault. Starting on 13 February, five cruisers, six destroyers, PT boats, and various other small vessels shelled Corregidor.³⁰³ They focused on fortified areas such as gun installations, caves, tunnels, and pillboxes.³⁰⁴ Naval forces shelled the island until the 16 February assault and also provided a maritime screen on the night before the operation.³⁰⁵ Their contributions, along with the air and ground assets made Corregidor a truly joint endeavor with successfully integrated components that should serve as a model for today's planners. At

³⁰⁰ Damberg, 7.

³⁰¹ Ibid.

³⁰² Ibid., 7-8.

³⁰³ Ibid., 8.

³⁰⁴ Ibid.

³⁰⁵ Ibid.

0829 the last bomb of the 3,128 tons dropped by the Fifth Air Force hit its target and at 0830 the first C-47 began to drop.³⁰⁶ This precision integration, enabled by thorough planning, helped make the operation a success.



Figure 6. Paratroopers in a C-47 Cargo Compartment

Source: Folder 546.072A, Air Force Historical Research Agency, Maxwell Air Force Base.

Despite the pre-assault preparation of the island by air and naval forces, the mission remained dangerous. The DZs' geometry allowed only a south to north run-in

³⁰⁶ Damberg, 4; Flash, 12.

course.³⁰⁷ This forced the troop carriers to fly over known enemy machine gun positions before and after each pass.³⁰⁸ The paratroopers had to face enemy threats, but they also had to contend with the jump. Both DZs were on the part of the island called Topside, meaning there were steep cliffs, approximately 500 feet tall, posing a hazard along with the “bomb craters, sharp cement boulders, tin, glass, steel blown from the nearby buildings, and sharp tree limbs sticking skyward” on the DZs.³⁰⁹ The high winds and limited steering capabilities of the parachutes only increased these threats.³¹⁰ Lackey estimated a 25-second descent for the paratroopers allowing them to drift approximately 250 feet, making drop accuracy a challenge.³¹¹ These hazards led Jones and Lackey to estimate jump casualties at 50 percent³¹² while the Sixth Army estimates were more optimistic at 20 percent.³¹³ For the troop carriers the assumption was that “some planes would be hit, and perhaps a few shot down” with the closest emergency airfields twenty-two and fifty miles away.³¹⁴ In other words, in spite of a comprehensive, detailed, and well-integrated plan, the risks were high.

³⁰⁷ Damberg, 3; Galvin, 219.

³⁰⁸ Damberg, 3.

³⁰⁹ Blair, 7; Flash, 7.

³¹⁰ Maurice Tugwell, *Airborne to Battle: A History of Airborne Warfare 1918-1971* (London: William Kimber and Co., 1971), 281.

³¹¹ Flanagan, 322.

³¹² Ibid.

³¹³ USAF Historical Division Liaison Office, *USAF Airborne Operations: World War II and Korean War* (Maxwell AFB, AL: Air University Press, 1962), 73.

³¹⁴ Damberg, 3.



Figure 7. Obstacles on a Corregidor Drop Zone

Source: Carl A. Damberg, “Airborne Operation Corregidor,” after action report, 1945, Headquarters 317th Troop Carrier Group, Combined Arms Research Library, Fort Leavenworth, KS, N-11138

Tactics and Theory

In February 1945, the European Theater drove airborne tactics. Guidance called for large, open DZs and short drop times.³¹⁵ Training complied with this guidance, and exercises consisting of division size night drops to massive, unobstructed DZs took place.³¹⁶ The Pacific Theater, however, did not offer airlift and airborne planners those types of DZs. Therefore, planners improvised in order to successfully meet objectives.

³¹⁵ U.S. War Department, Field Manual, (FM) 31-30, *Tactics and Technique of Air-Borne Troops* (Washington, DC: Government Printing Office, May 1942), 33-34.

³¹⁶ H. J. Terrell, Jr., W. D. Old, and J. T. Dalbey, “Combined Airborne Troop Carrier Maneuver 24 to 29 September 1944,” after action report, 1944, Camp Mackall, NC, Airborne Troop Carrier Maneuver Headquarters, 6-8.

Geography, availability of aircraft, and DZ size forced the tactics employed during the Corregidor drop. Airborne forces desired a drop formation consisting of aircraft in “Vs” to allow a battalion to land in an 800 by 1,200 yard pattern.³¹⁷ Normally, drop operations matched guidance and consisted of aircraft remaining in three-ship “V” formations throughout drop operations.³¹⁸ However, island drops forced troop carriers to fly new formations. On a previous drop at Nadzab in September 1943, the 317th Troop Carrier Group and 503 PIR dropped in three columns over one DZ.³¹⁹ Using this past experience, the two units again adapted to the situation and used new techniques to account for the terrain restrictions on Corregidor. Aircrew and airborne forces did not prefer the two columns employed to perform the operation, although necessary, due to tactical risks. Furthermore, the limited number of aircraft necessitated multiple passes, which also increased risk.

World War II airlift aircraft lacked the advantages of armor, speed, and armament forcing them to rely on cover from other aircraft and low altitude employment for security.³²⁰ The vulnerability of aircraft and the troops carried required air superiority to exist along the entire route but especially at the objective area.³²¹ As the aircraft slowed

³¹⁷ U.S. War Department, FM 31-30, 34, 73-74.

³¹⁸ Crawford, 20.

³¹⁹ John D. Poole, “Jungle Skippers: The 317th Troop Carrier Group in the Southwest Pacific and their Legacy” (Master’s Thesis, School of Advanced Air and Space Studies, Maxwell AFB, AL, 2014), 77-78.

³²⁰ U.S. War Department, “Training Circular No. 113” (Washington, DC, Government Printing Office, October 1943), 6.

³²¹ U.S. War Department, “Training Circular No. 113,” 2; U.S. War Department, FM 31-30, 74-75; U.S. War Department, Field Manual, (FM) 31-35, *Aviation in Support*

to drop speed, 100 mph for Corregidor, they became less maneuverable.³²² Furthermore, the pilots needed to maintain stability for the jumpers to exit properly. This created a situation in which the C-47s were extremely susceptible to enemy fire. To ameliorate this danger, Army manuals recommend that the drop time for a battalion remain under two minutes.³²³ This allowed the troop carrier planes to maintain maneuverability and reduced the time requirement for fighter cover. Making the minimization of exposure and closure are key factors for integrating air operations during an airborne operation.³²⁴ All of these concepts remain in today's doctrine and are practiced in modern airlift.

Limiting exposure and closure also protects the ground personnel because covering air assets able to provide effects on the ground cannot employ munitions with airdropping aircraft in the area. By reducing drop time, there is a smaller window between when pre-assault fires end and aircraft can begin providing Close Air Support. To limit these aspects of the operation, the airdrop formation should be as short as

of Ground Forces (Washington, DC: Government Printing Office, April 1942), 33; U.S. War Department, Field Manual, (FM) 100-5, *Operations*, (Washington, DC: Government Printing Office, June 1944), 291.

³²² Damberg, 2.

³²³ U.S. War Department, FM 31-30, 35.

³²⁴ Exposure is the common airlift term for the time a single aircraft is in danger. Closure is the common airlift term for the time a formation of aircraft is exposed to danger. Both commonly refer to operations over a DZ or during landing or takeoff when the airlift aircraft is at a slow, low energy state and, therefore, does not maintain the maneuverability necessary to react to threats. Closure is normally calculated from the time the lead aircraft's first jumper exits until the last aircraft's last jumper lands.

possible with no planned racetracks.³²⁵ The plan for Corregidor did not adhere to this theory.

Out of necessity the Corregidor drop used the longest possible formation geometry for each DZ. Unlike the Nadzab drop when DZ width allowed the formations to widen use lateral spacing to decrease total drop time, Corregidor forced a single-file drop to take place at each DZ. Furthermore, the limited DZ length necessitated pre-planned racetracks making the drop time one hour per lift.³²⁶ This excessive DZ closure affected air cover and also negated the first principle of airborne employment, “The element of surprise must be present.”³²⁷ After the first pass surprise was eliminated. In current operations the time over the objective during Corregidor is not practicable in an environment requiring air support unless tankers also support the mission. However, using additional aircraft also puts surprise at risk.

The airdrop during the day further limited surprise while also increasing the demands placed on supporting air assets. At the time, night operations were more common during training and called for less air escort to maintain surprise when contrasted with day drops which needed “preliminary air attacks against the prospective landing areas to destroy or disorganize local defenses.”³²⁸ However, day drops shorten assembly after landing and eased navigation and this likely forced the decision to attack

³²⁵ Racetracks refer to aircraft making multiple passes over the DZ.

³²⁶ Blair, 10; Crawford, 21.

³²⁷ U.S. War Department, FM 31-30, 33.

³²⁸ U.S. War Department, FM 100-5, 295.

in daylight due to the island's size.³²⁹ Furthermore, day drops made the task of hitting the small DZs easier for the paratroopers.

Wind speed, on the other hand, did not aid drop accuracy for the pilots or landing accuracy for the paratroopers. During the drop, the command plane's navigator estimated a 12 mph wind.³³⁰ However, troops began landing short of the DZ and the wind steadily increased with 20 mph winds out of the north.³³¹ This ran counter to airborne doctrine which called for winds less than 15 mph to drop.³³² High wind's effects on parachute operations have not changed, nor has their likeliness of existing in an island environment, showing another area where Corregidor should serve as an example in modern operations.

High winds factored into the plan to count past the "go point" for three seconds, eventually readjusted to six and then 10 seconds.³³³ Interestingly, period airborne manuals addressed compensation for wind drift as part of the curriculum for jumpmaster school, but only give tables for rate of fall with no drift factors.³³⁴ However, for Corregidor Lackey estimated a 25-second descent with a drift of approximately 250

³²⁹ Ibid., 293.

³³⁰ Damberg, 4.

³³¹ Ibid., 4, 8.

³³² J. T. Dalbey, "Airborne Troops in a Landing Assault," Conference on Landing Assaults 24 May-24 June 1943, transcript, July 1943, European Theater of Operations, U.S. Assault Training Center, Combined Arms Research Library, Fort Leavenworth, KS, N-6318-A.

³³³ Damberg, 3-4.

³³⁴ U.S. War Department, FM 31-30, 129-130

feet.³³⁵ His computations were erroneous, hence the need to adjust release point during the drop.³³⁶



Figure 8. C-47 Dropping on Corregidor Island

Source: Carl A. Damberg, “Airborne Operation Corregidor,” after action report, 1945, Headquarters 317th Troop Carrier Group, Combined Arms Research Library, Fort Leavenworth, KS, N-11138.

Just as the planning assumptions for the paratroopers’ drift were erroneous, much of the plan did not conform to the guidance and tactics. The drop was performed during the day to DZs that were too small using formations that were too long in winds that were

³³⁵ Flanagan, 322.

³³⁶ U.S. Air Force, Air Force Instruction (AFI) 11-231, *Computed Air Release Point Procedures* (Washington, DC: Government Printing Office, August 2005), 15. A planned drop height of 650 feet AGL equates to a time of fall of 26 feet per second. This estimate means that using the T-5 parachute, jumper weight was estimated as 275 pounds. Using these inputs and current airdrop theory, the drift effect is 254 yards or 762 feet.

too high. Furthermore, the troop carriers planned to make multiple passes and lifts leading to excessive exposure and DZ closure times and negating the surprise inherent in airborne operations. Therefore, the plan was unsound based on the accepted existing airdrop and airborne principles. High casualty rates were expected and planners should have anticipated a high percentage of paratroopers to land outside of the DZs. The outcome, however, proved that conventional airdrop philosophy was wrong.

Execution

At 0700 on 16 February 1945 the first formation of troop carriers departed Mindoro Island en route to DZs “A” and “B” followed by a second formation at 0730.³³⁷ The 51 C-47s flew toward Corregidor per the plan while the Fifth Air Force continued to pound the island with its pre-assault bombardment.³³⁸ The bombing stopped at 0829 allowing the Japanese troops defending the island to hear the approaching airdrop formation. At precisely 0830 the command plane made an observation pass over the island at 300 feet AGL and saw no enemy activity. It climbed to its position above the island as the other 50 aircraft began dropping six to eight men per pass on the two DZs.³³⁹

Assuming the estimated 20 mph headwind is correct, the ground speed of each aircraft over the DZs was 80 mph, although some pilots flew 85 or 90 mph instead of the

³³⁷ Damberg, 3.

³³⁸ Ibid., 4.

³³⁹ Ibid.

planned 100 mph in an attempt to improve drop accuracy.³⁴⁰ At this ground speed each troop carrier had 12.8 seconds over the DZ, also referred to as green light time.³⁴¹ Preflight planning calculated a ten second green light time and nine jumpers exiting per pass.³⁴² However, only six to eight paratroopers exited per pass meaning each C-47 needed three or four passes to drop its entire load.³⁴³ By dropping fewer people, the sticks increased their chances of all men landing on the DZ since the last paratroopers out the door would land on the trailing edge of the DZ if they jumped during the 12th second.

The troop carriers also increased drop accuracy by changing drop parameters after the first sticks dropped. These paratroopers were observed to be landing short of the cliffs to the south of the DZs with some landing in the ocean.³⁴⁴ The leaders in the command plane used this observation to order the count past the “go point” to increase from three to six seconds, which was still not enough to correct for winds. They readjusted the count to 10 seconds and lowered drop height to 1,000 feet MSL equating to 500 feet AGL.³⁴⁵ Paratroopers then started landing on the DZs using the new drop parameters.³⁴⁶

³⁴⁰ Ibid.

³⁴¹ The 80 mph ground speed equates to 117 feet per second. DZs were both 1,500 feet in length with no planned safety buffers in place for usable DZ length calculations.

³⁴² Damberg, 4; Shomburg, 1.

³⁴³ Galvin, 223.

³⁴⁴ Damberg, 4; Crawford, 26.

³⁴⁵ Damberg, 4.

³⁴⁶ With the aircraft traveling at 80 mph ground speed six seconds equates to 702 feet travelled and 10 seconds is 1,170 feet. Therefore, the aircraft dropped their first jumpers while nearing the trailing edge of the DZ. Based on the preflight planning numbers; the lowered altitude reduced the descent time from 25 to 19 seconds. This

The flexibility displayed by the aircrews and leadership enabled the first lift to complete 174 passes over the DZs between 0830 and 0932 dropping 1,021 paratroopers and 151 supply bundles.³⁴⁷ The outcome was that 92.5 percent of the drops were on the DZ and almost all of the other 7.5 percent fell short before the “go point” count increased. Luckily, only two C-47s were damaged during the drops, and they were both usable for the second lift.³⁴⁸

At 1035 the next wave of Americans landed on Corregidor during an amphibious assault of the 3rd Battalion, 34th Regimental Combat Team. The second airborne drop followed them at 1230. During this lift, the 51 troop carriers made 170 passes dropping 979 paratroopers and 159 supply bundles. Although the airlift crews had the experience of the first lift, drop accuracy only improved to 92.7 percent with airborne personnel still falling short of the DZs.³⁴⁹ Nevertheless, the adjustments made by the command plane and a slightly lower wind velocity reduced jump injuries during this lift.³⁵⁰

The most significant change between the two lifts was the end to naval and air fires on the island once the first paratroopers were in place. This allowed Japanese forces to emerge from caves to use small arms against the aircraft and paratroopers under

reduced drift effect from 762 feet to 557 feet. Therefore, the winds were stronger than estimated or the paratroopers were landing from 613 feet into the DZs to the DZs’ trailing edges after adjusting to 10 seconds. Since the six-second adjustment should have worked based on these numbers, the winds were probably stronger than estimated.

³⁴⁷ Damberg, 4-5.

³⁴⁸ Ibid., 5.

³⁴⁹ Ibid.

³⁵⁰ Blair, 16.

canopy. The defending forces hit eight aircraft and wounded one aircrew member during this lift.³⁵¹ The Japanese fired on descending paratroopers and bayoneted some of those who landed.³⁵²

The first planned lift on 17 February changed to an airlanding mission due to the successes of the paratroopers landing on the previous day. The 44 aircraft flew to Corregidor, dropped 197 supply bundles on 66 passes, and then proceeded to nearby San Macelino where they offloaded 843 men. The paratroopers later arrived on Corregidor via an amphibious landing. During the supply drops 16 C-47s were damaged and five aircrew were wounded.³⁵³

The second 17 February lift fared better with no planes hit by ground fire. This lift consisted of 191 passes by 33 aircraft dropping 785 parabundles. Both supply lifts successfully dropped an estimated 95 to 98 percent of their loads. This percentage either landed on one of the two DZs or was recovered by friendly forces.³⁵⁴

When the C-47 passes ended over Corregidor, a plan that broke from the accepted airdrop techniques of the day had succeeded in dropping on the objective while taking no aircraft losses or aircrew deaths.³⁵⁵ Flexible planning and adaptive thinking allowed airlift forces to successfully use contingency options to adjust during execution and

³⁵¹ Damberg, 5.

³⁵² Flash, 13.

³⁵³ Damberg, 5.

³⁵⁴ Ibid., 5-6.

³⁵⁵ Ibid., 6.

succeed in meeting their objectives. Limited resources and challenging terrain forced a plan that did not use tactically sound methods, but creativity permitted mission success and challenges to be overcome.

Results

The troop carriers meeting their objectives was the first step toward success on Corregidor Island, but ground forces then had to take the island. Planning assumed an enemy force of approximately 850 troops on Corregidor.³⁵⁶ However, the U.S. forces actually faced 5,643 Japanese.³⁵⁷ The airborne and amphibious assault troops succeeded in taking the objective with two battalions of paratroopers and one battalion of infantry killing 4,700 Japanese soldiers defending the island.³⁵⁸ The use of air and naval power in conjunction with the land forces made it possible.³⁵⁹

The assault on Corregidor Island was a model of joint cooperation and integration of air, ground, and naval forces.³⁶⁰ Using naval shelling and air bombardment drove the enemy into caves and gave the first lift of paratroopers the advantage of surprise as they operated against no organized resistance for nearly an hour.³⁶¹ Furthermore, the integration of joint components enabled lower than expected jump casualties. Although

³⁵⁶ Blair, 11.

³⁵⁷ Damberg, 12.

³⁵⁸ Ibid.

³⁵⁹ Ibid.

³⁶⁰ Ibid., 8.

³⁶¹ Blair, 28.

planned as 20 percent, 267 paratroopers were injured and twelve were killed during the drop for a 13.8 jump casualty percentage of the 2,019 troops dropped.³⁶² This was just 10.7 percent of the total force.³⁶³ Furthermore, 75 percent of the casualties occurred during the first lift as the troop carriers were still adjusting to the conditions at the DZs.³⁶⁴

The jump casualties represented a small portion of the 197 dead and 1,022 wounded in the operation.³⁶⁵ These losses occurred across twelve days of fighting, as U.S. forces defeated the last of the major resistance on 27 February.³⁶⁶ The operations officially ended on 2 March 1945 when Col Jones presented fortress Corregidor to Gen MacArthur who ordered the American flag raised over the island.³⁶⁷

The 317th Troop Carrier Group aircrews enabled this success. On 16 and 17 February they flew 189 sorties and made 601 passes over the DZs to drop the paratroopers and 1,292 supply bundles. They hauled 855,950 pounds and flew 73,815 miles in 527.25 flight hours. The troop carriers accomplished this while taking damage to 26 aircraft, only 13.7 percent of the total sorties and 4.3 percent of the passes over

³⁶² Damberg, 6.

³⁶³ James M. Gavin, *Airborne Warfare* (Washington, DC: Infantry Journal Press, 1947), 128.

³⁶⁴ Crawford, 28.

³⁶⁵ Galvin, 227.

³⁶⁶ Blair, 26.

³⁶⁷ Blair, 26-27; Flash, 24.

Corregidor.³⁶⁸ Furthermore, the airborne brought the advantage of surprise and reduced the high number of casualties that would have happened in an amphibious assault because the Japanese commander on Corregidor ignored warnings from his leadership to prepare for an airborne assault and instead defended against amphibious landings.³⁶⁹

While the numbers show how well the airlift forces performed during Corregidor, they do not capture the true successes of the mission. The airdrop relied upon effective integration with naval, ground, and air assets with an equal measure of creative thinking. By developing tactics to meet an unusual airborne mission, the planners overcame the obstacles Corregidor presented. An adaptable plan resulting from coordination between air and ground forces fueled success and showed the importance of flexibility in airborne operations.³⁷⁰ Put another way, “If there is a lesson to be learned from the Corregidor operation it is that orthodoxy and mental inflexibility have no place in airborne tactics.”³⁷¹ By remaining mentally flexible, the 317 Troop Carrier Group and 503rd PIR devised and carried out an operation that in some aspects “enjoyed a greater measure of success than any other airborne operation of the war.”³⁷²

The troop carriers’ at Corregidor succeeded by using various sources and some ingenuity to develop and execute their plan. Some of the tactics used are still the accepted

³⁶⁸ Damberg, 6.

³⁶⁹ Devlin, 580.

³⁷⁰ USAF Historical Division Liaison Office, *USAF Airborne Operations*, 76; Blair, 27-28; Crawford, 41-42; Flash, 27.

³⁷¹ Gavin, 130.

³⁷² Ibid.

norms. Although geography dictated some elements of the missions, the planners adapted to the situation and created methods suitable to the situation. The real lessons of Corregidor lie in the flexibility of the plan, the teamwork shown between the joint forces, and the precise integration with supporting air assets. Corregidor's planners also made the plan happen with limited resources, a constant factor in modern American airlift. These concepts are not well represented in today's doctrine, which mentions the need for certain aspects of these but offers no techniques for ensuring they exist. Based on what occurred at Corregidor, modern tactical airlift should seek ways to improve in these areas.



Figure 9. Corregidor After an Airdrop

Source: Carl A. Damberg, "Airborne Operation Corregidor," after action report, 1945, Headquarters 317th Troop Carrier Group, Combined Arms Research Library, Fort Leavenworth, KS, N-11138

CHAPTER 5

CONCLUSION

The last airdrop during World War II occurred over seventy years ago. In that time military aviation has advanced rapidly through technological developments and adjustments to tactics and doctrine. The same holds true for what was then called troop carrier aviation. Now called airlift, the equipment used is bigger, faster, and more capable. Airborne forces have also advanced technologically, using modern parachutes and weapons. The human body, however, has not changed. This means that delivering paratroopers still requires large aircraft to fly at slow, vulnerable speeds.³⁷³ Therefore, most of the doctrinal principles developed in World War II still apply.

The troop carriers of World War II pioneered a new form of combat aviation and created tactics and doctrine still in use. Their performance at Normandy allowed them to develop improvements, which were then tested in later drops and became doctrine. At Corregidor they adapted to a new situation and further enhanced doctrine. In both operations, many of the lessons learned concerning airlift tactics still exist in modern doctrine, but current doctrine does not completely address lessons regarding joint operations and air integration.

American troop carriers began developing their theory for employing their new form of combat aviation by watching the German military's invasion of Crete using

³⁷³ U.S. Air Force, Air Force Instruction (AFI) 11-231, *Computed Air Release Point Procedures* (Washington, DC: Headquarters Air Force, August 2005), 128. Current drop speed for delivering personnel is 130 knots, approximately 150 mph. While faster than the World War II drop speed of 110 mph, this is still an extremely slow speed compared to speeds flown by other aircraft in combat.

Fallschirmjäger tactics in May 1941.³⁷⁴ The Germans never attempted another large-scale parachute assault for the duration of the war due to the losses suffered, but the success of the operation sparked imaginations in the U.S. military.³⁷⁵ The Americans soon found out for themselves how difficult this type of operation could be to execute.

The Americans went to war with some ideas for paratroop operations contained in Field Manuals, but little guidance existed for troop carriers. Doctrine for the troop carriers was added as they gained experience in North Africa, Sicily, Salerno, and smaller-scale drops in the Pacific Theater of Operations. These experiences informed the production of “Training Circular No. 113,” which was created as a method of spreading lessons learned for the troop carrier and airborne force.³⁷⁶ With that document and the lessons learned in operations, the troop carriers went into Normandy and Corregidor.

In Normandy the IX Troop Carrier Command sent 822 C-47s and C-53s filled with 13,428 paratroopers into combat.³⁷⁷ The planners relied heavily on past lessons from other European airdrops as they built the operation.³⁷⁸ When finalized, the plan used

³⁷⁴ James A. Huston, *Out of the Blue: U.S. Army Airborne Operations in World War II* (West Lafayette, IN: Purdue University Studies, 1972), 48.

³⁷⁵ Ibid.

³⁷⁶ U.S. War Department, “Training Circular No. 113” (Washington, DC, Government Printing Office, October 1943), 1.

³⁷⁷ Paul L. Williams, IX Troop Carrier Command Report of Operation (Neptune), Incl. 13 (USAAF Form 34-C), 13 June 1944, Folder 546.452G 13 June 1944, Air Force Historical Research Agency, Maxwell Air Force Base, 2.

³⁷⁸ R. P. Carr, “Troop Carrier Planning for Operation Neptune, England Feb-Jun 1944 (Cross Channel Invasion of Europe), (Personal Experience of a Troop Carrier Wing Representative on the Planning Staff)” (Monograph, School of Combined Arms Regular Course Fort Leavenworth, KS, 1947), 7.

formation flight, air assembly, low altitude, and threat avoidance tactics very similar to those used by today's airlifters.³⁷⁹ The troop carriers also worked hard to integrate their plan with air and naval assets.³⁸⁰ This was partially done by including a Royal Navy representative in the planning cell.³⁸¹

Most aspects of the troop carrier plan went well and remain the methods used today. Still, the most important part of the mission, the airdrop, did not go well. Weather and enemy action caused some formations to break apart, leading to poor dispersion on the drop zones.³⁸² Also, in some cases the airborne troops and troop carrier aircrews did

³⁷⁹ Ibid., 6-12.

³⁸⁰ Ibid., 9.

³⁸¹ Ibid., 6.

³⁸² Robert Abraham, "The Operations of the 508th Parachute Infantry (82d Airborne Division) Normandy, France, 5-10 June 1944 (Normandy Campaign) (Personal Experience of a Regimental Demolition Officer)" (Monograph, Advance Infantry Officers Course, Fort Benning, GA, 1948), 11; John T. Joseph, "The Operations of a Regimental Pathfinder Unit, 507th Parachute Infantry Regiment (82nd Airborne Division) in Normandy, France 6 June 1944 (Normandy Campaign) (Personal Experience of a Regimental Pathfinder Leader)" (Monograph, Advanced Infantry Officers Course, Fort Benning, GA, 1948), 19; John A. Kindig, "The Operations of the 101st Airborne Division East of Ste. Mere Eglise, 5-6 June 1944 (Normandy Campaign), (Personal Experience of an Assistant G-3)" (Monograph, Advanced Officers Course, Fort Benning, GA, 1947), 18; Salve H. Matheson, "The Operations of the 506th Parachute Infantry (101st Airborne Division) in the Normandy Invasion, 5-8 Jun 1944 (Normandy Campaign) (Personal Experience of a Regimental Staff Officer)" (Monograph, Advanced Infantry Officers Course, Fort Benning, GA, 1950), 15.

not work together very well.³⁸³ The outcome was that only 10 percent of the paratroopers landed on their planned zone.³⁸⁴

Normandy put the tactical advantages and risks of night operations, low altitude flight, and weather on display. It also showed the troop carriers the importance of creating a properly integrated air plan and the necessity of support from other types of combat aircraft. Finally, it demonstrated that teamwork and shared understanding must exist between airborne and troop carrier personnel, a lesson that was validated during the drops on Corregidor.

Corregidor was very different from Normandy in scale, resourcing, planning time, enemy resistance, and geography. The troop carriers used the same published guidance as the previous operation, but it had to be tailored to the island environment. Through innovation and creativity, they developed a plan that accounted for unusually small drop zones and high winds not addressed in airlift manuals of the time.³⁸⁵ Although the geography forced them into tactically unsound drop formations and extended time over the objective area, integration with naval and air assets succeeded.³⁸⁶

³⁸³ Debriefing Conference-Operation Neptune, meeting transcript, 13 August 1944, Fort Leavenworth, KS: Combined Arms Research Library, N-12198, 1-2.

³⁸⁴ John C. Warren, *USAF Historical Studies: No. 97, Airborne Operations in World War II, European Theater* (Maxwell AFB, AL: Air University Press, September 1956), 33.

³⁸⁵ Carl A. Damberg, "Airborne Operation Corregidor," after action report, 1945, Headquarters 317th Troop Carrier Group, Fort Leavenworth, KS: Combined Arms Research Library, N-11138, 1, 4.

³⁸⁶ John H. Blair, III, "Operations of the 3d Battalion, 503d Parachute Infantry Regiment in the Landing on Corregidor, P.I., 16 February – 2 March 1945 (Luzon

The outcome on Corregidor proved the effectiveness of their planning. The troop carriers delivered 2,000 paratroopers with 92.5 percent accuracy on 344 passes over the drops zones.³⁸⁷ During the drops only ten aircraft and one aircrew member were hit by enemy fire, but all the aircraft were still flyable and the crewman was only wounded.³⁸⁸ The results would have been much worse without joint cooperation and suppression of the enemy provided by supporting forces. Furthermore, the trust and unity between the airborne and troop carrier units enabled flexibility, mutual understanding, and shared goals.³⁸⁹

The troop carrier mission to Corregidor used tactics that are familiar to today's airlift forces: formation, low level, and adaptation to geographical and resource constraints. It served as a positive example of how joint effort between airborne and troop carrier units could impact results. Furthermore, it reinforced the importance of an integrated air plan.

Modern airlift doctrine contains many of the lessons of Normandy and Corregidor. Air Force Tactics, Techniques, and Procedures (AFTTP) publications for employment of the C-130J, C-130H, and C-17 use methods similar to those used in both World War II examples. For example they advise, "Low-level flight reduces the chance

Campaign)" (Monograph, Advanced Infantry Officers Course, Fort Benning, GA, 1950), 28.

³⁸⁷ Damberg, 4-6.

³⁸⁸ Ibid., 5.

³⁸⁹ Blair, 9.

of visual, aural, and electronic detection.”³⁹⁰ This tactic was used in both missions. New technology has helped overcome some of the factors that caused poor performance at Normandy. Modern aircraft have radar systems vastly superior to those used in Operation Neptune and equipment enabling precise formation flight in weather. Furthermore, night vision goggles have made night employment of airlift much easier than the task faced by the Normandy troop carriers. Technology has also increased the accuracy of airdrops, changing the tactics used at Corregidor to successfully target small objective areas. However, technology does not ensure success.

The airlift AFTTPs are structured in a way that offers techniques and methods to approach each segment of the mission. For example, they contain a chapter on airdrop and another on formation. They then give different airdrop types and formation geometries within the chapters. Planners can then build missions that fit a given situation. This promotes flexibility and would allow airlift planners to adapt to an unfamiliar situation as the troop carriers did at Corregidor. However, these documents do not offer ways to integrate the plan with other air assets and teach nothing about the airborne tactics or procedures.

Field Manual 3-99, *Airborne and Air Assault Operations*, contains more cross-domain information, but it is not detailed enough to create shared understanding of methods and needs. It does a better job than the AFTTPs of stressing the importance of coordinated planning between the two communities. Still, this manual and the AFTTPs

³⁹⁰ Department of the Air Force, Air Force Tactics, Techniques, and Procedures (AFTTP) 3-3.C-130J, *Combat Aircraft Fundamentals C-130J* (Washington, DC: Government Printing Office, July 2016), 4-1. (U//FOUO) (Information extracted is unclassified.)

leave the lessons from Normandy and Corregidor about integration and teamwork unaddressed.

Joint doctrine is written “to enhance the operational effectiveness of joint forces by providing fundamental principles that guide the employment of US military forces toward a common objective.”³⁹¹ However, Joint Publication (JP) 3-17, *Air Mobility Operations*, and JP 3-18, *Joint Forcible Entry Operations*, do not address building a joint team between airborne and airlift forces. They also do not address integration of the air plan. They give broad guiding principles for airdrop similar to those found in the FMs created before and during World War II. They also recognize certain considerations such as the need for air superiority and drop zone selection factors.³⁹² The JPs explain the concept of airborne operations and familiarize high-level leaders with the use airborne forces.³⁹³ They do not, however, advance the cross-service understanding of practitioners of parachute insertion.

Today’s doctrine captures the many tactical lessons of Normandy and Corregidor. In fact, the overarching principles driving the tactics remain unchanged. Broad airlift concepts continue to endure because technology has not improved the human ability to exit an aircraft over the past seventy years. Therefore, airlifters must fly slow enough to

³⁹¹ Joint Chiefs of Staff, Joint Publication (JP) 1, *Doctrine for the Armed Forces of the United States* (Washington, DC: Government Printing Office, 2013), I-1.

³⁹² Joint Chiefs of Staff, Joint Publication (JP) 3-17, *Air Mobility Operations* (Washington, DC: Government Printing Office, 2013), IV-17-IV-18.

³⁹³ Joint Chiefs of Staff, Joint Publication (JP) 3-18, *Joint Forcible Entry Operations* (Washington, DC: Government Printing Office, 2012), B-1.

enable the paratroopers to jump. This requires the aircraft to remain slow, large, and vulnerable.

The vulnerability and unchanging characteristics of airlift also drive the need for the protection of other friendly aircraft, as seen at Normandy and Corregidor. This requirement is mentioned in modern doctrine, but there is little airlift guidance concerning integrating with other aircraft. Air integration starts with planning. Therefore, airlift AFTTPs can improve by adding common integration planning factors. These should focus on information needed by supporting assets and information needed from other air assets. By knowing what others need, airlift planners can begin coordination with information to offer from the first interaction and shorten planning time.

As important as the interaction with other air planners is, airlift's relationship with airborne forces is more important. Today's airlift begins at a disadvantage as compared to the World War II troop carriers. Organizational changes have made the two communities less familiar with one another. Furthermore, today's Air Force does not have the resources to maintain a community dedicated only to tactical airlift. Airlifters cannot focus solely on delivering and supporting paratroopers as they have worldwide commitments to fulfill that are many times higher priority than airborne support. These factors make it imperative that doctrine exists to help bridge the gap between joint partners.

Although leading up to Operation Neptune, the troops carriers and airborne worked closely together in rehearsals, there was interpersonal conflict during the

mission.³⁹⁴ The disputes, caused by lack of trust, increased the stress of an already tense situation. In one instance it lead to the loss of an aircraft.³⁹⁵ Normandy showed the how devastating it is when airlift and airborne force are not in agreement. Even with vast preparation the two communities did not have the same vision of what a successful outcome entailed.

The troop carriers and paratroopers at Corregidor taught the opposite of Normandy. Their previous experiences working with each other allowed a close, trusting relationship between the two communities.³⁹⁶ This started in planning with joint briefs occurring throughout even though there was a very short time from mission receipt to the actual operation.³⁹⁷ The cooperation continued during the drop, highlighted by the leadership from each group flying on the same plane and working in unison to ensure a successful parachute insertion.³⁹⁸ This type of teamwork should be sought in every personnel airdrop.

³⁹⁴ Debriefing Conference-Operation Neptune, 1-2; Warren, *Study No. 97*, 21-26.

³⁹⁵ Harrison Loesch, "Narrative Statement of the Crew of A/C #42-93002, 62nd TC Sq, 314th TC Gp, in Connection with Events of Bigot-Neptune #1," 14 June 1944, Folder SQ-TR-CARR-62-HI Jun 44, Air Force Historical Research Agency, Maxwell Air Force Base, 1-2.

³⁹⁶ Blair, 9; Edward T. Flash, "The Operations of the 2d Battalion, 503d Parachute Infantry Regimental Combat Team in the Recapture of Corregidor Island, 16 February–23 February 1945 (Luzon Campaign)" (Monograph, Advanced Infantry Officers Course, Fort Benning, GA, 1950), 8.

³⁹⁷ Donald A. Crawford, "Operations of 503d Parachute Regimental Combat Team in Capture of Corregidor Island 16 February – 2 March 1945 (Northern Philippines Campaign)" (Monograph, Advanced Infantry Officers Course, Fort Benning, GA, 1949), 14.

³⁹⁸ Damberg, 3.

Promoting teamwork and unity of effort between today's airborne and airlift forces begins with leadership and creating understanding between the forces. This takes cultural changes in each community, but doctrine can help bridge these gaps. By creating a doctrine publication shared by airborne and airlift and written with input from both communities, the two forces can start to appreciate each other's concerns, methods, and limitations.

The manual should target Company and Field Grade Officers who are instrumental in creating the needed team mindset. It should also include standard planning and operating procedures in order to decrease planning time. This helps planners approach their tasks from a shared perspective and launch missions more quickly; thereby increasing the strategic capabilities of American airborne forces by reducing the time it takes for them to enter the fight.

Cooperation between airborne and airlift communities starting with planning and continuing through entire operations is the overall goal of the proposed doctrinal additions. To enable that ends the publication should call for more and better joint training. The goal of the training is not only to gain repetitions in joint procedures, but it will also create trust. By seeing the abilities of each community and becoming comfortable with the other service's personnel, mutual trust builds. Trust then allows each community to believe that the intentions of the other are aimed at shared success. This will reduce frictions between airlift and airborne forces as seen during the drops at Normandy.

Furthermore, the doctrine should promote airborne and airlift attendance at each other's briefings as was done at Corregidor. This will help build the understanding of

each community's role that is often lacking during modern exercises. By understanding the other component's mission each community can develop practices better suited to meet their needs. Also, it will reduce the questioning of each other's methods that is often seen today. Instead of believing that certain airlift maneuvers are performed with no tactical necessity, airborne forces will understand their purpose from the beginning. Airlifters will also understand the importance of certain requests from airborne forces. In the end, this will help to prevent misunderstandings like those seen at Normandy when troop carriers were told to leave the paratroopers in the combat area without highlighting the need for accurate drops.

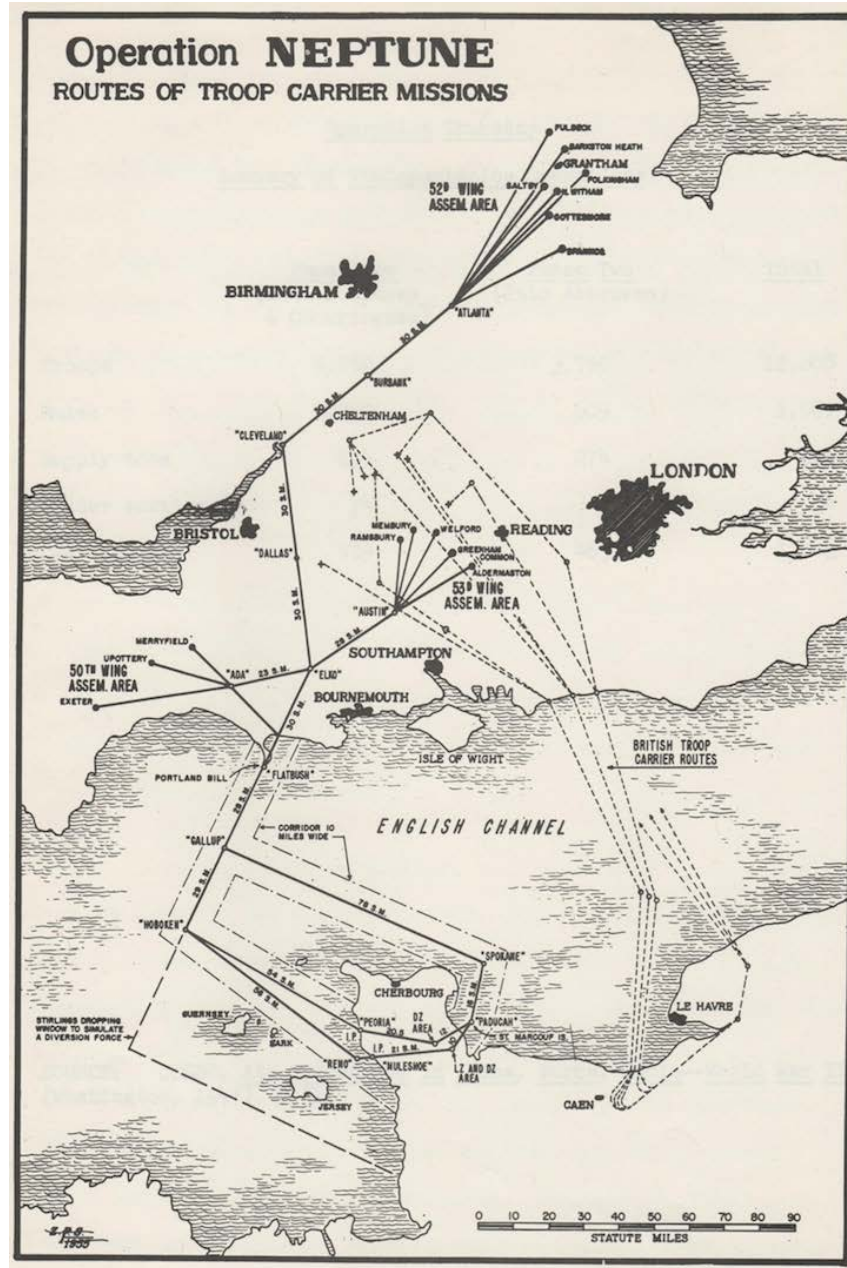
The new American airlift doctrine should endorse a culture of teamwork by viewing the two communities as one force when operating together. This aims to reduce the "us vs. them" mindset that often occurs during joint exercises. Currently, if airborne and airlift forces can avoid conflict and prevent misunderstandings, they can act as one joint team working towards a common purpose. If a future culture can be created in which the two communities truly believe they are one team, conflict and misunderstandings will be less likely to arise.

Further research is necessary to develop the specifics of the proposed manual. It will require going beyond tactical concerns and addressing uncomfortable concepts regarding leadership, human nature, and psychology. Also, it needs to address the cultural conflicts that exist between airborne and airlift personnel. If it does so successfully, it can help bring the two communities together to improve teamwork, efficiency, and effectiveness.

Airborne and airlift personnel all have the same mission, but they approach it from two very different backgrounds and skillsets. Their common purpose should drive them towards shared understanding and a team mindset. However, a lack of understanding often inhibits their ability to cooperate efficiently and effectively. By using doctrine to create standard procedures and promote a culture of teamwork, airlifters and paratroopers can work towards fully grasping an important lesson from World War II. Hopefully, this will prevent another situation like Normandy and increase instances of unified effort and teamwork as seen at Corregidor. Furthermore, it will prepare the joint team to face current and future threats.

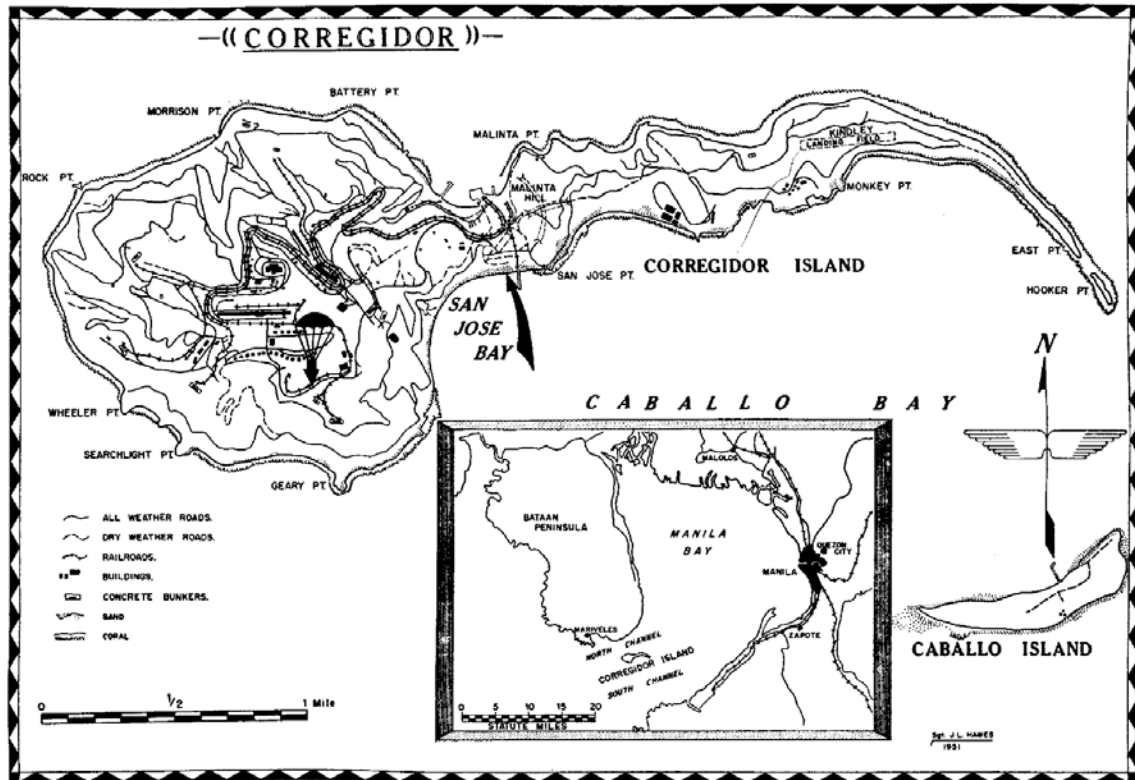
APPENDIX A

NORMANDY TROOP CARRIER ROUTES



Source: John C. Warren, *USAF Historical Studies: No. 97, Airborne Operations in World War II, European Theater* (Maxwell AFB, AL: Air University Press, September 1956), 13.

APPENDIX B CORREGIDOR GEOGRAPHY AND DROP LOCATION



Source: Wesley F. Craven and James L. Cate, *The Army Air Forces in World War II*, vol. 5 (Washington, DC: Office of Air Force History, 1983), 431, accessed 7 September 2016, <https://archive.org/details/Vol5ThePacificMatterhornToNagasaki>.

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